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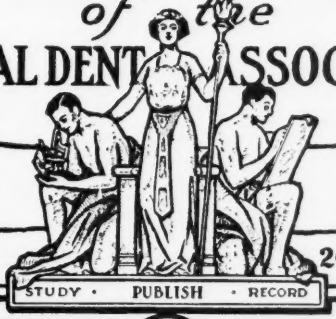

SEPTEMBER, 1920

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A Consideration of Pathogenic and Non-Pathogenic Pulpless Teeth.—*Grove.*

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THE JOURNAL
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National Dental Association
VOL. 7 SEPTEMBER, 1920 NO. 9

Original Communications.

A CONSIDERATION OF THE EXCHANGE OF DECIDUOUS FOR PERMANENT TEETH.

By Charles R. Baker, D.D.S., Evanston, Illinois.

(Read before the Englewood Branch of Chicago Dental Society, March, 1920.)

THE exchange of deciduous for permanent teeth is a subject that should be of great interest and importance to the general practitioner of dentistry in order that he may help the jaws develop normally by judicious treatment of the deciduous teeth. I feel that the deciduous teeth have not received the consideration due them and that in many cases they have been misunderstood, overlooked or neglected. Regular examinations of the deciduous teeth should be made, at intervals of about three months, so that they may be properly cared for and the occlusion studied. If this plan is followed, it is probable that the teeth of an average child could be kept clean, in good repair; the deciduous teeth could be removed from the arches at the proper time, or if lost prematurely, proper methods could be used, and as a result, the patients would enjoy better general health and there would be much less malocclusion.

At birth, in the jaws of a normal child, there are germs of teeth and partly formed teeth which eventually produce twenty deciduous and thirty-two permanent teeth, a total of fifty-two teeth for the individual. If the deciduous teeth *are* in normal arrangement and occlusion, which is true in most cases, the exchange of the deciduous teeth for their successors and the further development of the jaws is quite a complicated and very interesting process. Unless these changes occur in a normal manner, the final arrangement and occlusion of the permanent teeth will not be normal.

The premature loss and the prolonged retention of deciduous teeth are among the important causes of malocclusion.

By "premature loss" is meant the loss of a deciduous tooth so early in the development of the individual that malocclusion will result unless proper methods are used to prevent it. The premature loss of teeth will also impair the masticatory apparatus and this is an important item to a growing child. The loss of the normal mesio-distal width of a deciduous tooth, by caries or otherwise may produce practically the same results as regards malocclusion, so it is extremely important that the normal mesio-distal width of deciduous teeth be maintained. This is particularly true concerning the deciduous molars and cuspids but not so important where the deciduous incisors are involved.

By "prolonged retention" is meant the retention in the dental arch of a deciduous tooth so late in the development of the individual that malocclusion will result. While this applies to all of the deciduous teeth, it is particularly important concerning the deciduous molars, owing to the fact that they have greater mesio-distal width than the bicuspids which succeed them.

I will endeavor to describe briefly the normal eruption of the deciduous teeth and the manner in which they are replaced by their permanent successors. By "normal" eruption is meant the *average* eruption for I am well aware that there is great variation in different individuals as to the age as well as the order in which teeth erupt. I have also a few suggestions to offer regarding the treatment of cases of premature loss and prolonged retention of the deciduous teeth.

At birth, some of the teeth are pretty well developed and at six or seven months the lower central incisors usually erupt. The other deciduous teeth erupt in the following order: Lateral incisors, first molars, second molars and cuspids, the upper teeth generally erupting a little later than the corresponding lower teeth, and the deciduous teeth are in normal occlusion when the individual is two or two and one-half years of age.

When the child is four years old, there should be wide spaces between the deciduous incisors and cuspids. If this normal growth in the incisor region does not occur, the permanent incisors, which are much larger mesio-distally, will not have room to erupt normally between the strong deciduous cuspids, and the deciduous dental arches should be widened accordingly in advance of the eruption of these teeth.

At the age of six years, the permanent first molars erupt and assume their places immediately to the distal of the deciduous second molars. The deciduous teeth are lost and replaced by permanent teeth in the following order, the lower tooth usually preceding the corresponding upper tooth; central incisors at seven years, lateral incisors at eight years, first bicuspids at ten years, second bicuspids at eleven years and the cuspids at twelve years.

We will now consider the results of premature loss and prolonged retention of deciduous teeth and methods of preventing malocclusion from these sources.

Incisors: Please note that the deciduous incisors are all smaller than their successors. If one or more of the *lower* deciduous incisors are *lost prematurely,* the result will be a narrowing of the anterior portion of the lower arch and crowded lower permanent incisors, and this condition will, in most cases, produce a corresponding narrowing of the anterior portion of the upper arch, together with overlapping of the permanent incisors and an abnormally long overbite. This condition in the upper arch is due to the pressure of the lips and cheeks against the labial and buccal surfaces of the teeth. In a normal case, the tongue pressure on the lingual surfaces of the lower teeth helps to shape the dental arch and as the upper teeth erupt later

and the upper arch is larger than the lower arch, the muscular pressure of the lips and cheeks helps to guide the upper teeth into occlusion.

If one or more of the *upper* deciduous incisors are *lost prematurely,* there may be a narrowing of the anterior portion of the upper arch but this probably would not affect the lower teeth very much. In some cases, where the general occlusion is very good, the upper arch may continue to develop normally even if upper deciduous incisors are lost before their successors are due to erupt.

The appliance I would suggest using to maintain or produce space in these

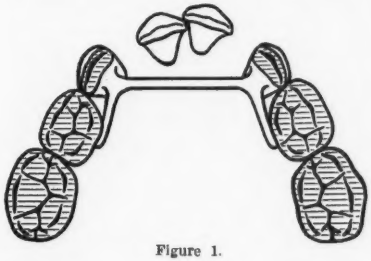


Figure 1.

cases is shown in Figure 1. Bands should be placed on the deciduous cuspids and a soldered lingual connecting wire used, which may be stretched to increase the space if necessary. A jack-screw, Figure 2, may be used instead of the rigid wire if considerable space must be produced between the deciduous cuspids for the permanent incisors. All of the appliances of this kind that I use are cemented to the teeth.

In cases of *prolonged retention* of a deciduous incisor, *upper or lower,* the permanent tooth is usually deflected to the lingual but occasionally to the labial. If the deciduous root is long and abscessed, it may prevent the eruption of the permanent tooth, or the pressure of the permanent tooth may cause absorption of the deciduous root in such a manner that the apical portion of this root is separated from the rest of the tooth and later forced thru the gum tissue to the labial. Such fragments should be removed.

Deciduous Molars. The exchange of the deciduous molars for bicuspids is a much more complicated matter than the changes in the incisor region, for the permanent incisors erupt in an area occupied only by deciduous teeth, the jaws have been growing in width for three or four years previous to their eruption and they are guided into position by the muscular pressure of the tongue and lips, between the deciduous cuspids. However, the bicuspids erupt between two areas occupied by perma-

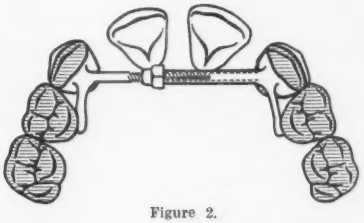


Figure 2.

nent teeth and considerable development of bony tissue. By studying Figure 3, you will see the average amount of tooth development at the age of ten years, when the first bicuspid is due to erupt, a well, developed permanent molar region to the distal and another well-developed region to the labial, the central incisor having been in position three years, the lateral incisor two years and the deciduous cuspid root but slightly absorbed. It is indeed a fortunate provision of Nature that the bicuspids are smaller than the deciduous molars or they probably would not have enough eruptive force to assume their places in occlusion. The large grinding surfaces of the deciduous molars are necessary, of course, for the growing child until some of the permanent molars erupt. In studying the deciduous molar region we will consider the teeth of one side of the jaws.

In cases of *premature loss* of one or both of the *lower* deciduous molars, the proximal contact pressure is lost and the normal pressure of the developing molars allows the permanent first molar to move mesially, while the pressure essential to proper space is not so important, for the upper anterior teeth occlude to the labial of the lower teeth and cannot move to the lingual or distal, and if the permanent first molar occludes well, it probably will not move to the mesial.

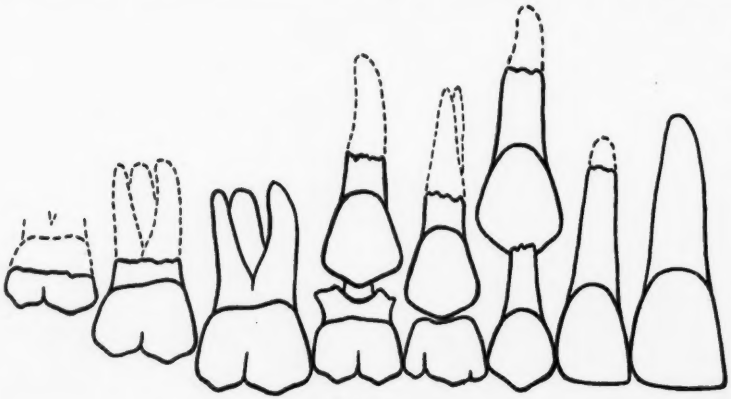


Figure 3.

hold the lower anterior teeth in normal relation to the upper teeth is lost, and the lower anterior teeth may move somewhat to the lingual and distal, which usually causes elongation of all of the anterior teeth.

Figure 4 illustrates an appliance that may be used in cases of premature loss of lower deciduous molars. The space

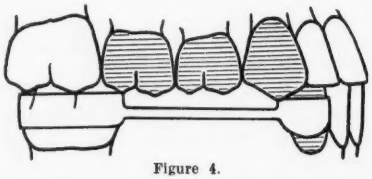


Figure 4.

maintained should be the space formerly occupied by the deciduous molars rather than the space required for the bicuspids that are to erupt later.

In cases of *premature loss* of one or both of the *upper* deciduous molars, the placing of an appliance to maintain the However, in some cases this tooth may have a tendency to move forward and an appliance similar to that used in the lower arch will be advisable.

In cases of *prolonged retention* of one or more of the *lower* deciduous molars, their successors are usually prevented from erupting or may be deflected to the lingual, or occasionally to the buccal. If the permanent first molars remain in normal occlusion, the upper bicuspids are usually separated and the upper anterior teeth inclined to the labial. Sometimes the upper anterior teeth remain in normal positions and the upper permanent first molar moves to the mesial of normal occlusion. The treatment of cases of this kind is to extract the deciduous molars and then examine the case at frequent intervals to see that proper space is maintained for the bicuspids and that the upper bicuspids do not elongate.

Cases of *prolonged retention* of the *upper* deciduous molars are of much more importance regarding occlusion.

These teeth do not harmonize in mesiodistal width with the lower bicuspids and if the permanent first molars are in normal occlusion, the upper anterior teeth are held too far to the labial to occlude normally with the lower teeth. During this period of rapid growth and development of the jaws, the upper as well as the lower anterior teeth elongate, due to lack of occlusion, and a great overbite of the upper anterior teeth is produced. Figures 5 and 6. This overbite is one of the most important features of occlusion. An abnormally long overbite not only prevents proper incising of food but produces an abnormal mastication by the bicuspids and molars due to inhibited lateral movements of the mandible. Later, when these upper deciduous molars are lost, the upper bicuspids may possibly assume normal occlusion with the lower teeth, but the abnormal overbite of the upper anterior teeth will remain and is a serious form of malocclusion.

Figure 5.

The exchange of the deciduous molars for bicuspids is extremely important for, unless the upper and lower arches (each lateral half being considered separately) develop uniformly and harmoniously in the deciduous molar region, and the exchange of these teeth is practically normal, the final result will be malocclusion. An upper deciduous molar must be lost from the arch at approximately the same time that the corresponding deciduous lower molar is lost or malocclusion will result. Normal occlusion will not result if there are deciduous molars in one jaw and bicuspids in the opposing jaw (on the same side of the mouth) during the period of rapid growth of the jaws, for the teeth will not be of proper size to harmonize.

The idea that all deciduous molars should be kept in the arches as long as possible is wrong. There is a definite time when each deciduous molar should be lost. It is important as a general rule, to keep the lower deciduous molars in the arch until the lower bicuspids are ready to erupt, but as soon as the lower first bicuspid erupts, the upper deciduous first molar should be removed from the arch. As soon as the lower second bicuspid erupts, the upper deciduous second molar should be removed from the arch. The upper deciduous molars should be removed at the proper time regardless of the physical condition of the teeth themselves or the age of the patient. It is a matter of the relation of the individual tooth to the development of the jaws.

Figure 6.

Figure 7 shows the relative mesio-distal widths of the deciduous and permanent teeth, the size (taken from Black's Dental Anatomy) of the average tooth being indicated in millimeters.

We will now consider illustrations of different combinations of deciduous molars and bicuspids. In these pictures the permanent molars are shown in normal occlusion. In some cases the anterior teeth might be in normal occlusion and there would be a corresponding condition of malocclusion posterior to the deciduous molar region. These pictures are drawn to scale of average teeth and the deciduous teeth are horizontally lined.

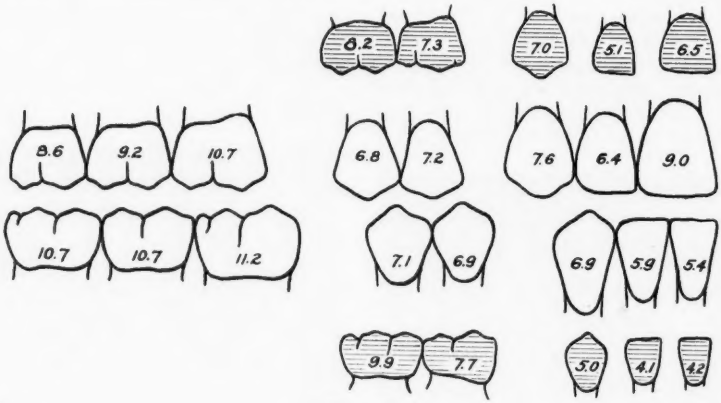


Figure 7.

Figure 8. This shows all of the deciduous molars in normal occlusion.

Figure 9. The lower first bicuspid has erupted and at this time the upper deciduous first molar should be removed.

Figure 10. This shows what happens when the upper deciduous first molar is left in the arch. The upper anterior teeth are held to the labial of their normal positions, due to the fact that the upper and lower teeth do not harmonize in mesio-distal width.

Figure 8.

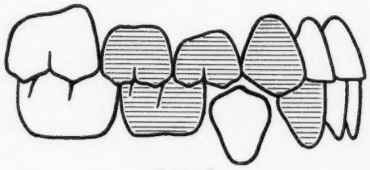


Figure 9.

Figure 11. This shows a normal condition; both first bicuspids and both deciduous second molars in place.

Figure 12. The lower second bicuspid has erupted and at this time the upper deciduous second molar should be removed.

Figure 13. This shows the result when the upper deciduous second molar is left in the arch. All of the upper teeth mesial to this tooth are held in abnormal positions.

Figure 14. All bicuspids have erupted and there is normal occlusion.

Figure 15. Showing both upper de-

ciduous molars and both lower bicuspids in place. This is the worst possible combination of these teeth. Note how the large deciduous molars hold the upper anterior teeth too far to the labial to occlude with the lower teeth and that

Figure 10.

all of the anterior teeth, upper and lower, may elongate.

Figure 16. In this case both upper deciduous molars, the lower deciduous first molar and second bicuspid are in

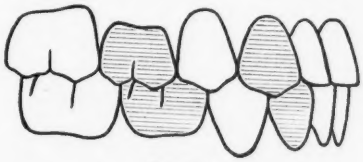


Figure 11.

place. Malocclusion of the anterior teeth is produced by lack of harmony in mesio-distal widths in the deciduous molar region.

Figure 17. This shows the upper first

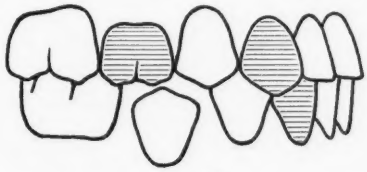


Figure 12.

bicuspid and deciduous second molar and both lower deciduous molars in place. There is a slight malocclusion of the anterior teeth due to discrepancy in widths.

Figure 18. Showing the upper first bicuspid and deciduous second molar and the lower deciduous first molar and second bicuspid in place. Note that the upper anterior teeth are held too far to the labial.

Figure 19. This shows the upper deciduous first molar and second bicuspid and both lower deciduous molars in

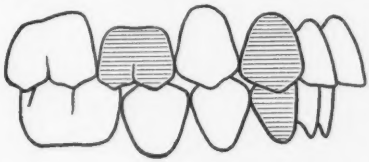


Figure 13.

place. In this case the lower arch is too large to harmonize with the upper and spaces may be found between the upper anterior teeth.

Figure 20. Here both upper bicuspids

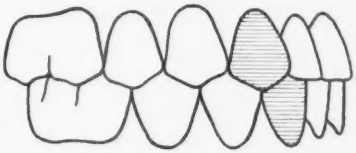


Figure 14.

and both lower deciduous molars are in place. Note the lack of harmony of arches and the resulting abnormal occlusion. We may expect to find spaces between the upper anterior teeth

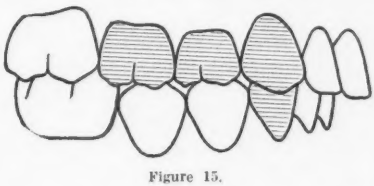


Figure 15.

and the crowns of these teeth inclined to the labial.

Figure 21. Showing upper deciduous first molar and second bicuspid and lower first bicuspid and deciduous second molar in place. Lack of harmony is evident.

Figure 22. Both upper bicuspids and

lower deciduous first molar and second bicuspid in place, showing lack of harmony.

Figure 23. A case where all of the deciduous molars were lost from the arches at about the same time. In this

Figure 16.

case the upper bicuspids erupted first and elongated until they occluded with the lower gum tissue. A result of the injudicious extraction of deciduous molars.

Figure 24. This is a drawing of a

Figure 17.

case in practice where all of the deciduous molars and the upper deciduous cuspid were lost and the upper first bicuspid has erupted. An appliance is shown, consisting of two bands and a connecting

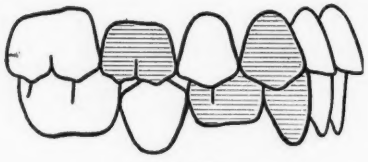


Figure 18.

wire so arranged that the bicuspid will not erupt to an abnormal length

Figure 25. Showing malocclusion caused by the premature loss of a lower deciduous second molar. The space should have been properly maintained by use of an appliance and the malocclusion prevented.

Some men, who have realized that the mesio-distal width of a deciduous molar was preventing normal occlusion of other teeth in the arch and who did not

Figure 19.

feel warranted in extracting a sound tooth that was useful in mastication, have compromised by grinding away the marginal ridges of the deciduous molar, as shown in

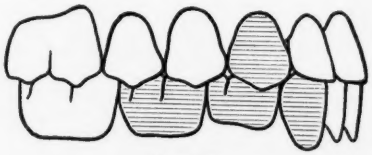


Figure 20.

Figure 26. However, this produces a liability of caries and death of the pulp and there remains the wide-spreading roots which may hold the roots of the approximating teeth apart or cause an

Figure 21.

abnormal inclination of those teeth. If the pulp dies and an abscess results, the roots probably would not be absorbed and malocclusion might result.

When deciduous teeth are extracted, care should be taken to see that each

entire tooth is removed, for frequently small fragments of these roots remain and are not absorbed, and cause malocclusion of the erupting permanent teeth.

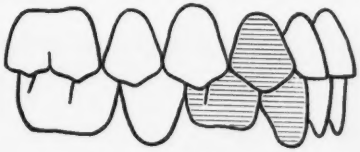


Figure 22.

This is particularly true in regard to deciduous molars.

The molars are the most important

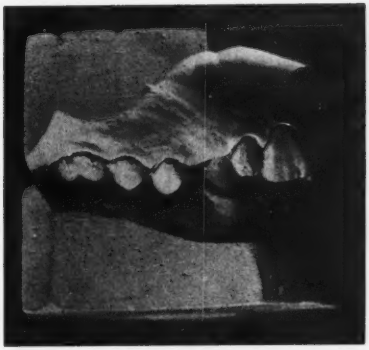


Figure 23.

of the deciduous teeth and they exert more influence on the occlusion of the permanent teeth than do any other teeth.

Figure 24.

When they are moved, in correcting malocclusion, and too much absorption of their roots has not occurred, the bicuspids are usually moved along with them, due to their intimate relationship, which is not true regarding other teeth. The deciduous molars, therefore, are directly responsible for the positions of the bicuspids; they also directly in-

Figure 25.

fluence the positions of the permanent molars; and as explained, they are in many instances responsible for the posi-

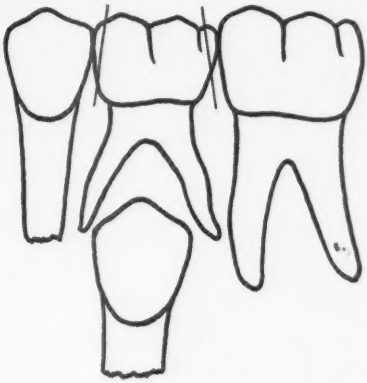


Figure 26.

tions of the anterior teeth. Therefore, we should see that the deciduous molars are placed in normal occlusion, kept there until the proper time for their loss from the arches and removed at that time.

Cuspids. As the cuspids are the last of the deciduous teeth to be lost, they should receive careful attention so that they may be kept in the arches until the permanent cuspids are about to erupt.

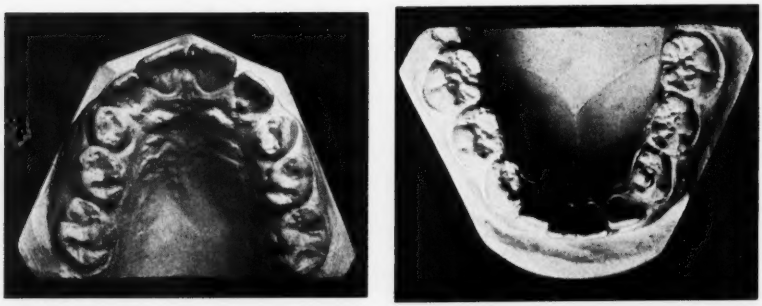


Figure 27.

In case of *premature loss* of a *lower* deciduous cuspid, the posterior teeth move forward and the anterior teeth remain where they were or incline to the lingual until in some cases the deciduous

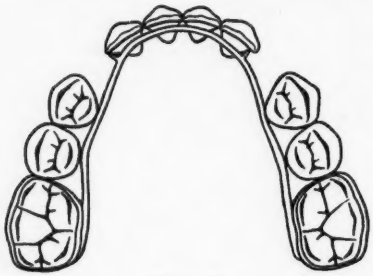


Figure 28.

first molar (or first bicuspid) is in contact with the lateral incisor.

In case of *premature loss* of an *upper* deciduous cuspid, similar conditions may result. Figure 27.

An appliance, Figure 28, may be used to maintain the space occupied by the missing teeth and to increase this space for the permanent cuspids.

In cases of *prolonged retention* of deciduous cuspids, *upper or lower,* radiographs should be used to determine the presence and location of the permanent cuspids and the case should be carefully studied as to the probability of placing these teeth in normal occlusion. In some cases the deciduous cuspids should be extracted and an attempt made to move the permanent cuspids into their proper places, while in other cases, it is advisable to leave the deciduous cuspids alone and have the unerupted permanent cuspids removed. There is always a possibility that the pressure or influence of an unerupted tooth may cause absorption of one or more roots of other teeth.

Radiographs should be used in all cases before extracting deciduous teeth if there is any question as to the presence of their permanent successors.

When orthodontic treatment of the deciduous teeth is advisable, the best time to accomplish results is when the roots of these teeth are fully developed and not absorbed, usually at the age of three to four and one-half years.

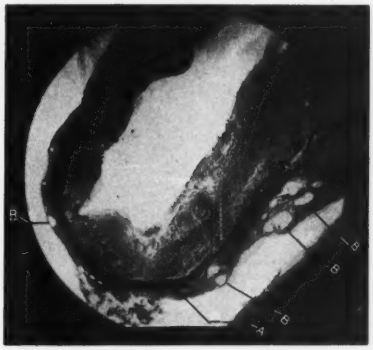
A CONSIDERATION OF PATHOGENIC AND NON-PATHOGENIC PULPLESS TEETH.

By Carl J. Grove, Ph. G., D. D. S., St. Paul, Minn.

(Read before the Northwestern District Iowa State Dental Society, Sioux City, Iowa, Dec. 4, 1919.)

THE production of diseases from such bacteria as streptococcus, carried by the blood stream to the heart valves, kidneys, brain or any of the tissues of the body are always dependent upon the resistance of the organism to the forces opposing it. The protective forces of the body are often the determining factor of the severity of the maladies produced in the individual attacked, whether the organism is from an infected tonsil, gall bladder, appendix or periapical tissue.

Figure 1.



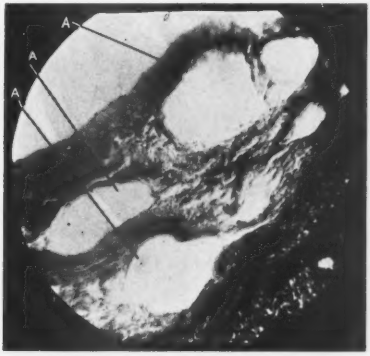
Granuloma (a) fibrous capsule (b) (b) (b) (b) blood vessels where bacteria enter blood stream.

Bacteria is transported from these foci thru the blood vessels in the tissues of the infected area, (1) referring to bibliograph) and are carried to the locality where a favorable field for its lodgment is encountered, producing a secondary infection. Figure 1 shows blood vessels in a periapical abscess. (a) fibrous capsule, (b) blood vessel.

Figure 2, a high magnification of blood vessel shown in Figure 1.

That certain germs have selective

Figure 2.



(a) (a) (a) high magnification of blood vessels shown in Figure 1.

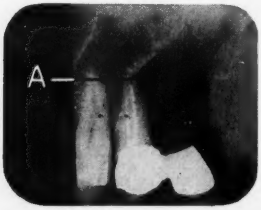
tissue for lodgment, can no longer be questioned. The favorable field of selection may be in the heart valves, in the muscle fibres, in the nerve tissue or in the joints. Infectious diseases are therefore a result of a battle between these forces.

The Importance of Thoroly Removing Infections.

We are dealing with one of the largest questions of life, and it is our individual duty to assist all whom we serve, to se-

cure the maximum comforts of health by means of minimizing infections of the mouth. It is absurd to assume that such can be accomplished unless all teeth with infections are eradicated. In this connection I wish to point out the importance of removing all infected tissue involved by periapical abscesses. There are two very important reasons for this. First, if the infected tissue is not surgically removed at the time of extraction, it will necessarily have to be disposed of thru disintegration, producing toxic products and the absorption of these toxines will continue until all these infected tissues have been disposed of, and it

Figure 3.

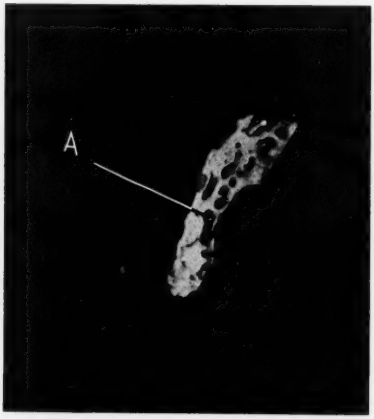


(a) Shows infected area remaining some years after extraction of abscessed tooth. Curettement should always be done in such cases.

is possible that the absorption of these products assist the secondary infection already developed, to make further inroads into the areas attacked. While if these dead tissues are thoroly removed surgically when the teeth are extracted, a better opportunity for the eradication of the systemic condition will surely be afforded. The second reason is, that not infrequently these abscesses remain after the teeth are removed. I will show a picture directly of such a case. Since there is no reason for such tissue remaining, they should always be removed when the teeth are extracted. Are we, as a specialty of medicine, willing to advise the retention of infected teeth, and turn a deaf ear to the bacteriological knowledge offered us regarding disease-producing organisms and allow our afflicted patients to continue struggling with these deadly forces.

Figure 3 is made from a radiograph taken of the area of the upper lateral, which was extracted nine years previous to the time this picture was taken; (a) the abscessed area. In operating, a very bad infection was found. If a curettement had been done in this case at the time of extracting, I believe the infec-

Figure 4.



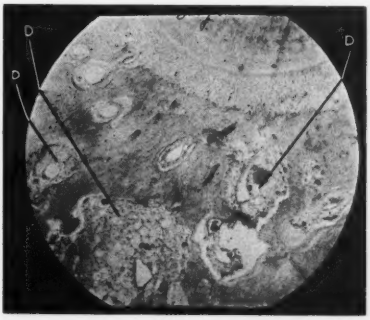
Character of bone surrounding roots is shown. Space in the bone contains medulla which is often destroyed by infections resulting in dead bone.

tion would have cleared up. Merely a curettement is not always sufficient in badly infected sockets. It is sometimes necessary to pack and irrigate after the operation. We must regard these cases as strictly surgical, and treat them as such. The more thoroly we surgically remove these infected tissues, the less nature will be required to do, thus we assist the resisting forces of the patient.

Figure 4. I wish to show a slide that clearly illustrates the histology of the bone structure involved by these infections. You will observe the medullary space at (a) containing tissue which is very susceptible to infection,

because of its cellular make-up. The opposing forces of these tissues can not equal those of soft tissue because the medulla is enclosed in bone which will not expand to allow migration of antibodies in as great numbers as would accumulate in the soft tissue. When an infection occurs in the medulla, bacteria invade these tissues very readily as the canals communicate directly with other medullary spaces, as is shown at (d) (d) (d) on Figure 5. When the medulla or the tissues of this space are destroyed, and a thorough surgical removal of bone involvement. Where chronic abscesses exist, the peridental membrane is involved and when the membrane has been destroyed, the cementum is deprived of its only means of nutrition and death ensues. In these cases a re-attachment of the membrane will not take place. It will not be possible for vital tissue to ever become attached to dead cementum. This cementum would be a source of constant irritation resulting in inflammation and followed by infection. I will

Figure 5.



(a) root, (b) peridental membrane, (c) bone, (d) (d) (d) medulla.

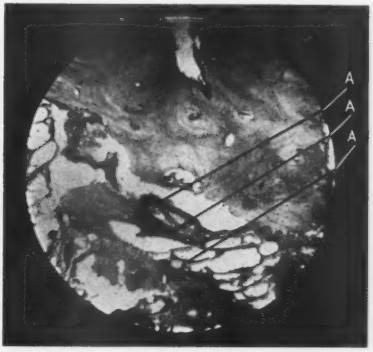


Figure 6.

the bone is deprived of its means of nutrition which results in the death of the bone. Examination of the sockets should always be made after extracting, to ascertain if the bone is necrotic.

In support of what I have already said in reference to the destruction of the medulla by infections of this nature, I wish to show a slide, Figure 6, (a) (a) (a) from an infection produced in the medulla of a dog, illustrating this condition clearly.

Should Abscessed Teeth Ever Be Retained?

I am frequently asked what method of procedure I advise regarding abscessed teeth. There is only one course to pursue in such cases, and that is extraction show a slide, Figure 7, prepared from an abscessed tooth (a) abscess (b) root (c) showing detachment of membrane. No method of treatment will ever restore such a condition to its normal state.

Such teeth should never be retained. Some advocate surgical removal of the infected area. I cannot recommend such a practice, as the dentin forming the root end, in such cases is also dead tissue. A membrane will not be formed or attached to dead dentin. The root end will be a source of irritation.

In this slide, Figure 8, is where an amputation was performed upon a dog showing the condition resulting (a) root (b) peridental membrane.

Are All Pulpless Teeth Pathogenic?

Thus far I have considered only briefly, some of the fundamental facts which investigations in pathology, bacteriology and clinical observations have revealed. Altho much of importance regarding this question has not as yet been explained, the available material will, however, serve as a working basis in the solution of the problems confronting us, upon the question of infections.

Figure 7.

(a) Granuloma, (b) root, (c) shows where the peridental membrane is detached from root. The membrane will not reattach to roots in such cases, but the root will remain bare and cause irritation.

Another important and perplexing problem to be solved, a question which is receiving a great deal of thought and study by investigators of both the medical and dental profession of today. The question I have reference to is: "Are all pulpless teeth pathological?" The opinions advanced regarding this problem are equally divided, but no definite facts have been presented which will furnish even a hope of the right course to pursue.

There are many phases of this question yet to be considered before a complete and safe working method can be offered. I will state, however, that all pulpless teeth are not pathological and teeth that are not pathological are not pathogenic.

I will present for your consideration my reasons for this assertion. I realize that many investigators assert that they obtain strepticoccus from the roots of all pulpless teeth, and advocate their removal because of such findings. If bacteria exists at the apex of these teeth, the peridental membrane surely would be involved sufficiently to show some pathology. Would it be possible for

Figure 8.

Shows results following amputation of root of a dog. (a) root, (b) where root was amputated, showing attachment of new membrane.

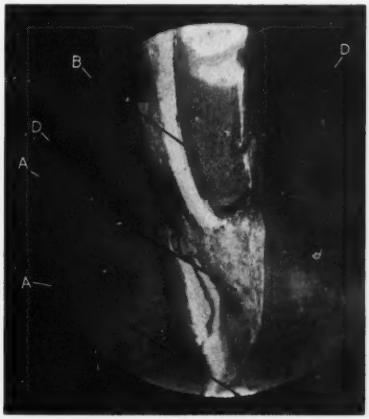
bacteria of this nature to be present and not produce some disturbance of the membrane? I have made microscopic examinations of many sections of extracted teeth which show no disturbance of these tissues.

I will show a slide, Figure 9, taken from a section of one of these teeth, showing the tissue in the apical portion of (b) root filling. There is no evidence of the action of bacteria. If bacteria existed at the apex (a) surely some evidence of infection would be found in the tissue located at the foramen. There is one thing of interest in this section which I wish to call your attention to, cementum has formed on the

inside of the foramen at (d). This is undoubtedly a result of nature's attempt to close the foramen. I have in the past suggested that this tissue be preserved in devitalization. I first presented these views at the Minnesota State Dental Society in 1915; since that time at various State societies and many other dental organizations.

In Figure 10 at (a), point of union of

Figure 9.



A section made from a pulpless tooth. The root was filled some years previous to the extraction. Note vital tissue (a) filling foramen (b) root filling. This is not pulp tissue but peridental membrane (d) (d) cementum lining root-canal. This tissue should not be destroyed by medicaments or mechanically when pulps are removed. Such findings prove that all pulpless teeth are not pathological.

the pulp and the peridental membrane is shown very clearly. As the pulp tissue is small at this point it will naturally separate from the membrane when it is removed from the root-canal. It will also be seen at (b) where the peridental membrane dips into the large foramen. In time the foramen becomes smaller, obliterating the membrane tissue, leaving only small canals for the admission of the blood vessels (c) (c) which pass thru the peridental membrane to the pulp (3). These canals are the foramia shown in the specimens exhibited in my clinic. This is another slide, Figure 11, from an extracted pulpless tooth showing a portion of the membrane at the apex (a) just opposite the foramen, which is also normal.

Is it possible for bacteria to remain for years at the apex of pulpless teeth without causing some destruction of the

Figure 10.

Showing the peridental dipping into the foramen.

periapical tissue? I cannot conceive of how this is possible. I realize that abscesses may form in positions where they could not be located from a radiograph as shown in this slide, Figure 12, (a) (a) (a) three abscesses.

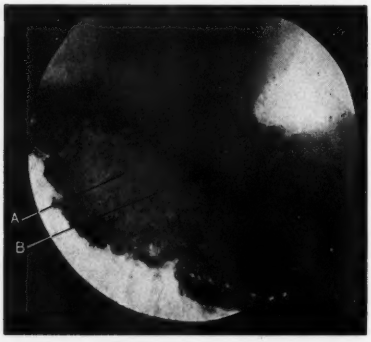
There are many questions yet to be determined before it can be said positively that the facts I have brought out regarding these pulpless teeth will be of any practical value. I have not ascertained what percentage of these teeth are free from infections. It is difficult to obtain enough of the membrane from extracted teeth to make them of value in this investigation. It may be found that

the percentage of teeth which are free from infection is so small that it would not be advisable to retain them.

Some Causes for Infections.

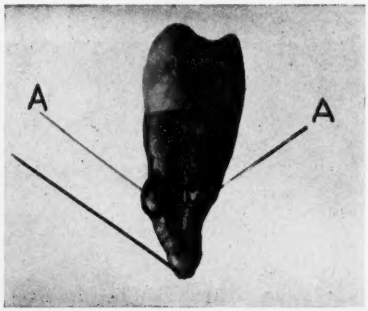
I would like to consider very briefly some of the important causes for these infections. I realize that most dentists are of the opinion that imperfectly filled roots are the cause of periapical abscesses. This is a slide, Figure 13, of a chart showing the findings in the examination of one thousand (1000) radiographs. This explains itself. Note that a smaller percentage of infections exists where a fairly good filling is made in place of those filled to the apex (4). What evidence has been produced to show that imperfectly filled roots cause abscesses? If a study of the anatomy of root ends is undertaken, one will readily realize that perfectly filled roots cannot be made.

Figure 11.



Another section from an extracted pulpless tooth showing a normal membrane (a) root (b) proving that all pulpless teeth are not pathogenic.

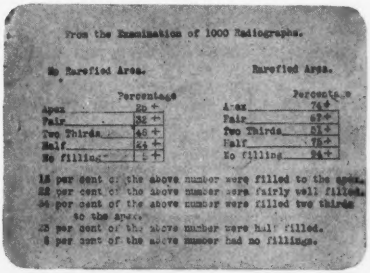
Figure 12.



A tooth with three abscesses (a) (a) (a). Peridental abscesses.

Before proceeding further with the discussion on this question, I wish to make clear the purpose of this argument. I do not wish to discourage the efforts made to do thoro root-canal work, but I do wish to show that some of the methods employed defeat the very purpose one attempts to achieve. It must be remembered that the foramen of root canals is usually somewhat divergent, as shown in this slide, Figure 14, which makes a perfect sealing of the root end impossible by the methods now in vogue. The divergent portion of the canal can not be filled with a point or a cone, and if filled with a liquid or a semi-liquid, the liquid would absorb and leave the end concave. This would be sufficient to admit a lodgment of serum or the accumulation of fluids. If the peridental membrane is intact, I do not believe this would cause serious disturbance, for the peridental membrane dips into the foramen as is shown at (a) in Figure 14. But if this portion of the membrane is destroyed, following the use of acids or any other agents that are destructive to vital tissue, the liquid would not be absorbed, but would decompose, causing irritation resulting in infection. Great care should always be exercised to avoid destruction of this tissue. I believe a preservation of these tissues is very important and will at least aid, if not prevent, infection in teeth whose vital pulps are removed. I might state that this opinion is based upon results

obtained from animal experimentation along this line. I will show a slide, Figure 15, where a forty per cent solution of sulphuric acid was used in a


From the Examination of 1000 Radiographs.

No Rarefied Area.

	Percentage
Apex	20 +
Fair	32 +
Two Thirds	46 +
Half	44 +
No filling	+

Rarefied Area.

	Percentage
Apex	74+
Fair	67+
Two Thirds	54+
Half	78+
No filling	94+

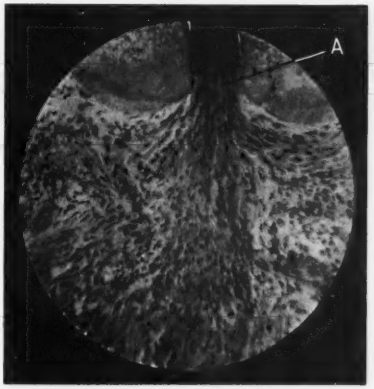
15 per cent of the above number were filled to the apex.
22 per cent of the above number were fairly well filled.
36 per cent of the above number were filled two thirds to the apex.
25 per cent of the above number were half filled.
2 per cent of the above number had no fillings.

Figure 13.

root-canal of a dog where a destruction of this tissue has occurred (a) (a).

I will also show what the effect of formaldehyde is on periadical tissues (a) root (b) peridental membrane. If the

Figure 14.



(A) Showing how the peridental membrane dips into the foramen.

membrane is destroyed, there will be an absorption of the bone or the alveolar process opposite the point where it is detached from the root (2). Figure 16 shows the fibers extend thru the membrane to the process. The function of the process is to supply attachment for the membrane; when this part of the membrane is destroyed, the function of the process terminates, therefore absorption occurs and a rarefied area results. The tissue in this part of the root-canal should never be destroyed or removed in devitalizations. The pulp does not extend thru the foramen in fully developed teeth as we have been taught.

Figure 15.

(a) (a) shows how the tissue in the foramen is destroyed, also detaching and destroying peridental on each side of foramen by use of 40% sulphuric acid in root-canal. Infections often result from such treatment.

The foramen is formed by cementum which as all know, is formed by cementoblasts. If this were pulp tissue the foramen would be formed of dentin by the odontoblasts in the pulp tissue.

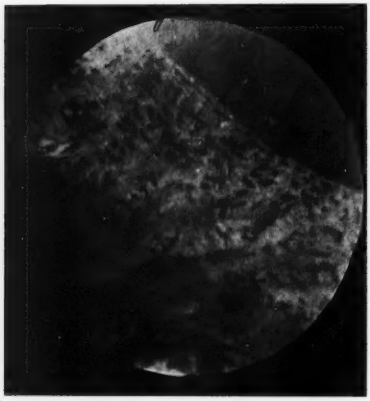
In Figure 17 it can readily be seen in this slide that the foramen is formed by cementum, (a) peridental membrane, (b) cementum, (c) dentin. Remedies that have properties of destroying vital tissue should not be allowed to come in contact even with cementum, for if the vitality of cementum is destroyed the attachment of the membrane may be affected. Agents of this nature should

never be used in root-canals. In my opinion the use of such agents are the chief cause for periapical infections. This opinion is based upon the evidence presented.

PRESERVING THE TISSUE AT ROOT ENDS.

I realize that many men believe that the rational method for dealing with teeth requiring devitalization, is the use of the forceps. While I absolutely disapprove of pulp devitalization only where an accidental exposure of a normal pulp is made or in selective cases where decay makes exposure necessary in the excavation of decayed dentin. I believe every man here will, in course of time, do such devitalization but under strictly aseptic conditions, and using as great care in avoiding the destruction of periapical tissue, as the extreme root-canal operators of the past were to destroy and remove all this tissue, which will, at least, greatly reduce the present percentage of infections of pulpless teeth.

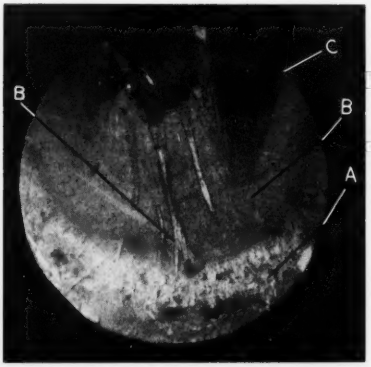
Figure 16.



Showing fibers of peridental membrane running from cementum (a) to the bone (b).

Recent study of the root-canal question has been largely from a bacteriological standpoint. The methods employed today are founded upon the bacteriological investigations which I regard as being of the greatest value, but let us not forget that the pathology, physiology, histology, embryology, anatomy and biology of root ends and periapical tissue are equally essential to a complete solution of this vital problem.

Figure 17.



Showing cementum forms foramen (a) peridental membrane, (b) cementum, (c) dentin.

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INTERMAXILLARY WIRING.

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Frequency of Use.

OF ALL of the various methods of apparatus and other means of immobilizing fractures of the mandible, the use of intermaxillary wiring between the upper and lower teeth is perhaps employed as extensively and more universally than all other splints combined. When the general surgeon has to reduce a fracture of the mandible he usually uses some plan by wiring the teeth together unless he uses a Barton or a Plaster bandage, it would perhaps be surprising to know the number of fractures of the mandible treated with intermaxillary wiring by general surgeons thruout the United States in the course of a year. Great numbers of dentists do not consider any other method of immobilization of fractures of the mandible than by the use of intermaxillary wiring, and dental officers are often obliged to resort to this as their only method of treating fractures of the mandible in the field or in small stations.

It is a bit strange in noting the fact that this method is so extensively employed and possesses so many salient advantages in the sub-severance of some of the most important basic principles of fracture reduction that more statistics and literature are not on record on this subject. It is also a noteworthy fact in comparison with other phases of surgical technic that the methods of intermaxillary wiring have not been standardized in point of principles with certain variations rendering it adaptive to the range of individual cases.

Very little writings on this subject are to be found in textbooks of Oral Surgery and Operative Dentistry, or in the current periodicals and abstract literature.

The fact exists that while individual operators develop certain personal ideas on the subject, the general plan of procedure is usually clumsy, full of dangers, tedious to insert, easily loosened, difficult to tighten, easily broken, hard to repair and usually attended with harrassing trouble to the operator, pain to the patients, the results of which usually make it necessary to retain the wires longer and not infrequently inviting complications which may partake of a very serious nature.

Advantages of Intermaxillary Wiring.

Perhaps the chief outstanding advantage of wiring the upper and lower teeth into close contact is the fact that this plan of reduction of malposition is founded strictly upon the basis of original occlusion, normal position of the fragments and absolute rest to all parts in normal position, including the muscles of mastication and those of expression, as well as other overlying tissues. There is no bone in the body which demands more exactitude in the accuracy of reduction of fractures than in the mandible, for without the restoration of

perfect occlusion and harmony in the features when both passive and active, the solidified fracture is a failure. Frequently, when even a thin covering of material is attached in the form of a splint between the upper and lower teeth, there will be a slight change in the relations between the fassetts worn by the intimate contact of occlusion and attrition which, if only 1 Mm., will make the patient very uncomfortable permanently, unless the cusps of the teeth are ground into occlusion or otherwise adjusted by orthodontic procedure, all of which means permanent injury to the teeth, or an otherwise extravagant expense of time, material and energy. It has been a noteworthy fact in more than 100 fractures of the mandible treated with intermaxillary wiring in comparison with a greater number employing other methods that the patients who complain bitterly of the soreness thruout the Maxillo-Facial area before their teeth are wired together or if other forms of splints that have been inserted will, within the course of 24 hours after intermaxillary wiring has been inserted, be entirely free from all soreness, or even the sensation of tenderness in the parts. This point is a very important one and due regard should always be given it in the early considerations of a case, and should always be a factor included in the design of appliance selected.

The reason this relief is prevalent with intermaxillary wiring reverts back to the principle of perfect rest and normal position, and in view of the fact that the upper and lower teeth are bound into perfect relations, one of the greatest added points in favor of intermaxillary wiring is the assurance that the functional relation is going to be restored perfectly and with occlusion as the chief guide, it can be safe to assume that the facial outlines cannot be materially displaced and changed.

Other advantages of intermaxillary wiring are:

1. Requires only a few instruments and a little material.

2. Economy of time which would be spent in the construction of splints.

3. Ability to insert under any conditions.

4. It may be inserted with comparative ease to the patient by the operator.

Disadvantages of Intermaxillary Wiring.

The chief disadvantage is the liability of strangulation. After patient's injury has been examined and this method elected for treatment, the wires should *never* be inserted until after the patient has recovered from shock and other complications, as it will be found that the reduction of the fracture can be made effectively later. The liabilities of strangulation from hemorrhage, nausea, etc., must be well guarded against. No patient should ever have the upper or lower teeth wired or locked together unless many teeth are absent when undergoing a general anesthetic or taking a sea voyage, or under any circumstances which would lead to a similiar effect.

The statement was current in America that in the early stages of the World's War, the British lost a number of soldiers by strangulation, from nausea caused by seasickness in crossing the English Channel with their jaws wired together. It is also a fact that serious dangers were experienced in the hospitals of the Allies, in France, from strangulation caused by secondary hemorrhage, intra-oral infections, and nasopharyngeal secretions, nausea and other involvements before the wires could be

cut. This method was employed very extensively by U. S. Army Dental Surgeons in the early treatment of fractures of the mandible. Upon studying the records of approximately 500 injuries of the mandible, it was found that this method was used with good judgment, and excellent results, but with great variety of designs. Some cases were treated with intermaxillary wiring to support extensively displaced fragments,

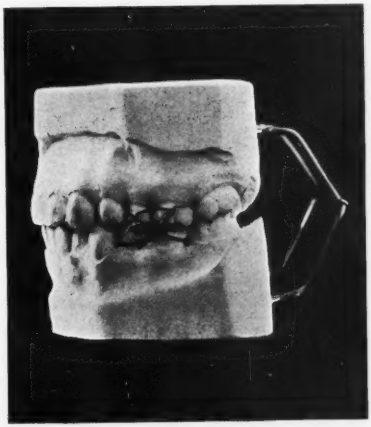


Figure 1.

while other splints were in course of construction, and other cases were treated exclusively with intermaxillary wiring. There was not a single soldier returned to the United States with intermaxillary wires in position as the reresult of a very rigid order prohibiting any patient from going aboard a vessel with the jaws locked together in any way. Patients who were being treated had their wires cut in the embarkation hospitals, and, if no other splints were inserted, they were allowed to remain open freely until treatment could be resumed immediately after debarkation.

Other apparent disadvantages of intermaxillary wiring are impaired feeding, and the unhygienic conditions caused by the mouth being closed. If the patient possesses all upper and lower teeth, the greatest handicap for the entrance of food thru the mouth is present, but, as a rule, a few teeth at least are missing and a patient can receive a great variety of nourishment, such as the full list of liquids and semi-solids, and usually the patient will weigh more at the end of six weeks with the mouth shut, and should at no time complain of hunger. From this standpoint of mouth hygiene, cleanliness can be maintained by methods described later.

Methods of Wiring.

The most positive attachment is to be made by twisting wires tightly into the cervical constrictions of all remaining upper and lower teeth, but when all of the ends of wires are twisted together, the bulk of material would be so great as to press into the buccal and labial mucosa, and keep these tissues abraded at all times. This and the difficulty of cutting these wires in an emergency makes such extensive wiring unnecessary, so that it should be considered that if the mandible can be supported in normal occlusion from three points of suspension that is quite sufficient, and will make impossible any motions of the mandible. The design of wiring should be easily inserted, easily tightened, and free from sufficient projection of the twisted ends which would cut into the soft tissues of the mouth.

Figure 1 illustrates the common method of wiring between posterior teeth. Suitable wire is twisted very tightly into the cervical constrictions of two upper and two lower teeth on each side of the arch; these ends are brought

together and tightened in the form of a cross tie, or all of the wires are twisted together. A review of this method presents the following conditions: Individual wires twisted tightly around the neck of a tooth must be too tight to slip, or the wire will loosen and is no good for the purpose. If these wires are tightened sufficiently they are very greatly weakened at the point of the twist, and breakage is very liable, and in the event of breakage the entire operation has to be done over again.

In wiring between four teeth, eight ends of wire are presented to be twisted together, which usually makes a large button of wire which has to be covered with cement or gutta-percha for protection. The large number of wires twisted together as per this plan makes it very difficult in case of an emergency to cut them loose. When these wires loosen by the natural forces of the mandible pulling against them, they can rarely be tightened without breakage, therefore, it is claimed that unless teeth which are standing alone *must* be used, it is never necessary to employ separate wires around teeth individually.

Herewith are submitted two methods of intermaxillary wiring which, in the writer's experience, have proven universal in application, have eliminated all the objections of other designs and have added in exchange many desirable qualities.

Figure 2. Illustration showing preparation of instruments and materials. The best wire should be as large as possible to pass freely between inter-proximal spaces, soft enough to be intimately adaptable, and tough enough not to break easily. The large sizes of Angle's ligature wire or 22 G. pure annealed copper are the best materials to be found. The instruments needed are a pair of cerated broad-nosed pliers, cerated long-nosed pliers, a pair of short-nosed scissors, and a tenaculum or a small hook-shaped instrument. In preparation of the wire, a one foot length is folded around a small end instrument, and a loop is pinched into the form of an eyelet as shown in this illustration.

Figure 3. After selecting the teeth to be wired in pairs the ends of an eyelet-wire are inserted beneath the point of inter-proximal contact as shown between the right upper molars, one end is then drawn around the anterior tooth, and the other end around the posterior tooth, as shown adjusted around the left upper posterior teeth.

Figure 4. The two ends of the upper wires are drawn thru the eyelets pointing downward and the ends of the lower wires are drawn thru the eyelets pointing upward. This forms a noose around the teeth which by twisting the ends, all of the excess can be drawn up, causing these wires to grip the teeth very tightly. For the incisors these loop wires may be laced around the laterals as well as the centrals in order to defuse the strain and prevent elongation. The upper and lower ends can then be twisted together, and after the twist is quite tight the ends may be pulled outward, thus drawing all of the excess to the point of the twist, then by twisting the pliers again and with the same motion of the arm bending the ends inward against the teeth, it will be found that the strain will be defused thruout the entire length of the wire and there will be no circumscribed point where breakage is liable. The great satisfaction of this method lies in the facts that:

1. There is no bulk of wire.
2. They may be quickly cut.

3. They may be tightened daily with ease to the operator.

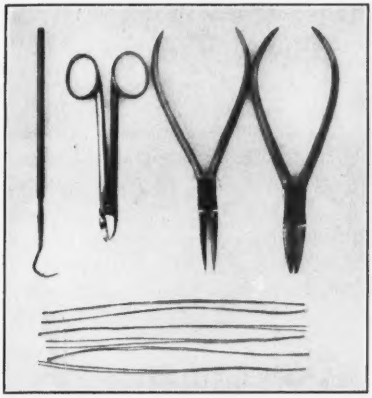


Figure 2.

4. They rarely break.

5. If a wire breaks it may be replaced without material injury to the others.

Figure 3.

Figure 5. While the above method is highly satisfactory in practically every phase, at the same time it is possible to improve upon it with a modification of the same idea. This illustration shows the employment of twenty-two gauge pure annealed copper wire with the eyelets placed for three points of sus-

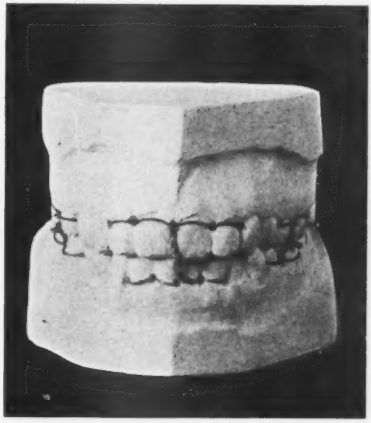


Figure 4.

Figure 5.

pension in the same positions as in the preceding methods, but it is not intended that the ends of these wires are to be twisted together so it will be noted that in the upper arch instead of bringing the ends thru the eyelets, one end is passed beneath the eyelet and they are twisted together tightly at some remote point. In the lower arch the strand of wire crosses above the eyelet.

Figure 6. Illustrating the individual tie wires inserted thru the eyelets.

Figure 7 illustrates the individual tie wires twisted together. This method possesses all of the advantages of the preceding method with the following additions:

1. If a patient is to receive an anesthetic these wires may be placed so that the mouth may be left open until the danger of nausea is passed.

2. The tie wires may be cut in order to test the fracture and if it is found that solidification is not complete they may be immediately replaced without all the necessary work of starting from the beginning.

INTERMAXILLARY WIRING FOR POST-ELEVATOR FRACTURES.

Figure 8. Radiograph antero-posterior position illustrating the post-elevator fracture between the right neck of the condyle and the Symoid notch. It will also be noted that there is an inter-depressor fracture between the lower central incisors. This was an accidental fracture caused by a blow against the left side of the mandible.

Figure 9. Illustrating the method of intermaxillary wiring employed. Heavy copper eyelet wires united by means of Angle's ligature tie wires are attached to the posterior teeth, and inasmuch as the upper incisors were spaced and of poor anatomical form, it became necessary to construct individual bands for these teeth, and to solder spurs pointing upward over which to attach the wires, and as a lateral force had to be exerted between the lower incisors, the band and and spur method were also elected as shown in the photograph. When there is sufficient time and equipment at disposal, this band and spur method is well worth the time, and as a principle, it is very greatly to be relied upon. This case happened to be one exception wherein the consideration of the rationale of retaining the lower incisors in line of fracture was adopted against the general rule and which proved successful. Upon referring to Figure 8 it will be noted that the head of the right condyle was deflected outward by the direction of the force of the blow, and the line of the fracture. Upon making pressure over the fracture, crepitation was very apparent so it was decided to apply an extra-oral apparatus in conjunction with the intermaxillary wiring.

Figure 10. Extra-oral apparatus made by attaching two discs of metal ¾ inch in diameter to a loop of 8G. iron wire fitted over the vertex of the cranium to which pads were adjusted and a strap sewn to hold the loop in position securely, and to make it easily adjustable. The pad over the right condyle successfully depressed the posterior fragment and held it securely until it became agglutionated into position.

Figure 11. Radiograph antero-posterior position with the extra-oral headpiece in position.

INTERMAXILLARY WIRING FOR INTER-ELEVATOR FRACTURES AND LOSS OF SUBSTANCE IN THE RAMUS.

Figure 12. Radiograph lateral view illustrating a loss of substance of between 4 and 5 Cm. thru the middle

third of the ramus. Note that the upper and lower eyelet wires are in position.

Figure 6.

This radiograph was taken with the mouth open to show the effects of the

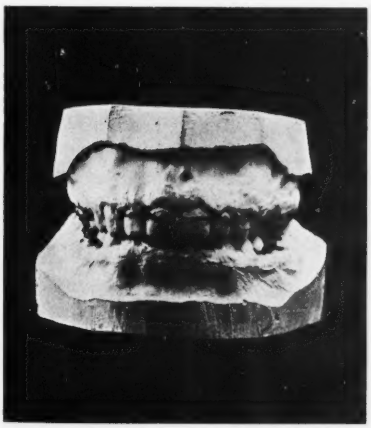


Figure 7.

"open-bite" splint, for it will be noticed that the loss of substance allows the action of a false joint to close the space between the fragments directly proportionate in amount, to the extent of which

Figure 8.

the mouth is opened. This indicates that if occlusion is to be retained and if the radius from the condyles to the

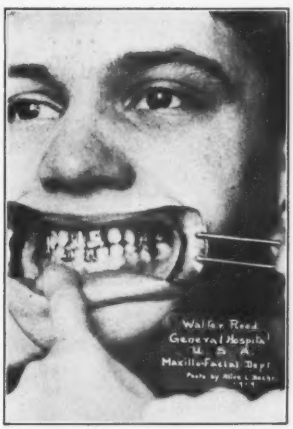


Figure 9.

symphesis, as well as facial balance, are to be retained, "open-bite" splinting methods are incorrect and that such

methods as intermaxillary wiring are better indicated.

Figure 10.

Figure 12.

Figure 13. Radiograph lateral view, same case as Figure 12, illustrating the ramus. Intermaxillary wiring for pre-elevator fractures (fractures of the

Figure 11.

Figure 13.

mandible closed with tie wires in position. It will be noted that in comparison with Figure 12, twice as much space exists between fragments of

Angle) at this location in the mandible are perhaps more frequent than at any

other point with the possible exception of fractures thru the lower canine sockets, and usually these two locations become fractured at the same time. If an "open-bite" splint is employed in pre-elevator fractures, the fracture line becomes a substitute to the Temporo-mandibular joint thereby causing it to open. This allows the elevator muscles to pull the ramus upward, which in turn, projects the body of the mandible forward and opens the fracture so that fragments possess only one point of contact located at the posterior border. For these reasons, a fracture of this location perhaps indicates "closed-bite" splints or intermaxillary wiring more than any other region of the mandible.

Figure 14. Radiograph lateral view of pre-elevator fracture left angle. The third molar in line of fracture was extracted and the mandible secured to the superior arch by the passage of the ends of the wires thru the eyelets and twisted together.

Figures 15 and 16. Photographs showing point of exit, machine gun bullet, which passed thru the body of the mandible in the pre-elevator region.

Figure 17. Radiograph lateral view showing loss of substance of above case.

Figure 18. Mandible immobilized in correct occlusion by the method of placing auxillary tie wires thru the eyelets between the upper and lower arches.

Figure 19. These arches were left untied until after the bone graft operation, in which the ends of the fragments were freshened, scar tissue excised between and periosteum from the tibia planted to the buccal and lingual surfaces.

Intermaxillary Wiring for Post-Depressor Fractures.

Figure 20. Radiograph lateral view post-depressor fracture communicated with mesial root of first molar. This tooth was left in line of fracture and a modified Gunning splint inserted as noted in this radiograph.

Figure 21. Condition of patient upon arrival at Walter Reed General Hospital Gunning splint in position. Infection draining from external sinus in neck as shown in this photograph.

Figure 22. Radiograph lateral view illustrating the same case as Figures 20 and 21, showing extraction of first molar and curettage of the tract, removing considerable sequestrum and granulation tissue. Mandible was then immobilized to the superior arch.

Figure 23. View of intermaxillary wiring employed which afforded the proper care for the soft tissues, rest in normal position for the bone fragments with successful results.

Intermaxillary Wiring for Multiple Fractures of Mandible.

Figure 24. Radiograph antero-posterior position showing post-elevator, pre-elevator and inter-depressor fractures situated thru the neck of the right condyle, left angle and right symphesis respectively. In this radiograph it will be noted that, as is typical in multiple fractures, the muscles have distorted the fragments in numerous directions, thus causing a non-occlusion and facial disfigurement.

Condition of patient upon arrival at Walter Reed General Hospital following automobile accident while on furlough, 15 days after, splints none, infection none, partial solidification in malposition. All teeth in line of fracture were extracted, upper and lower eyelet wires were adjusted and the tie wires put thru the eyelets, patient was administered gas-oxygen anesthetic and by forcible manipulation the fragments were loosened and placed in natural

occlusion, auxillary tie wires quickly twisted to position.

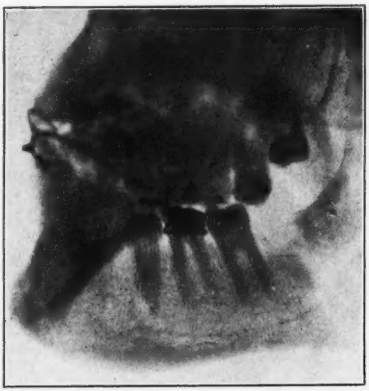


Figure 14.

Figure 25. Tie wires in position. Mandible drawn up into correct occlusion with upper arch.

Figure 15.

In the average fractures of the mandible intermaxillary wires are retained in position for six weeks, modified slightly by the exact conditions of individual cases. The patient is always *provided* with a pair of short-nosed scissors and is cautioned to keep them on the person or by the bedside *at all times*. This eliminates liabilities and

Figure 16.

Figure 17.

the feeling of anxiety or responsibility in case of an emergency, and the patient

Figure 18.

is instructed to cut or have cut the wires at any instant when strangulation is

Figure 20.

Carbohydrates and other bone-building foods should be the chief diet. For the hygienic care of the mouth the follow-

Figure 19.

Figure 21.

imminent. Patient is given a list of suggestions of liquid and semi-solid diet

with instructions to absorb at least 2400 calories equivalent of food per day.

ing triple mouth washes are found to be thoroly cleansing and refreshing:

1. Two mouthfuls tepid 25% Hydrogen Dioxide.

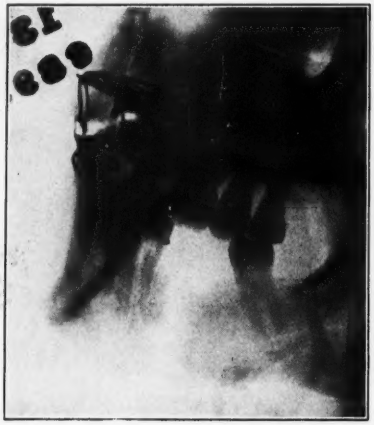


Figure 22.

2. Two mouthfuls 1% Potassium Permangenate.

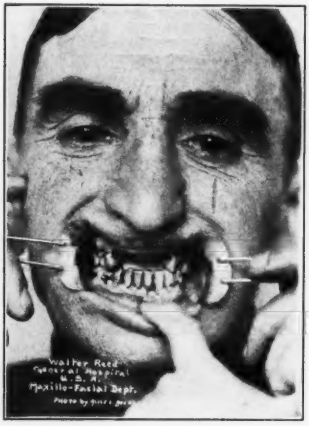


Figure 23.

3. Liquir Antisepticus or Liquir Antisepticus Alkayinas (U. S. P.) or any suitable proprietary mouth wash of refreshing flavor.

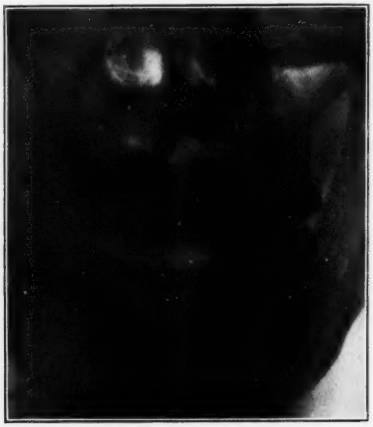


Figure 24.

The patient is instructed to report to the office *daily* and the wires are watched carefully, kept tightly adjusted, and a close observance maintained for the first signs of any complications or sequelae.

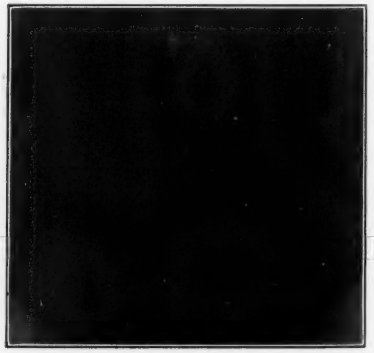


Figure 25.

THE DENTAL CORPS OF THE PHILIPPINE NATIONAL GUARD.

By Major Louis Ottofy, D. D. S., M. D., Supervising Dental Surgeon, Manila, P. I.

ORGANIZATION.

SECTION 23 of the Militia Act, approved by the Governor-General of the Philippine Islands, on March 17th, 1917, made provision for the appointment of five dental surgeons with the rank of First Lieutenant. On June 23d following, the writer was appointed Captain in the Medical Department, and two days later, by Special Order No. 10, was, "in addition to his other duties, detailed to organize and supervise the work and instruction of the dental surgeons, Medical Department."

PERSONAL.

Upon recommendation, the following dentists, all graduates of reputable American dental colleges, were appointed with the grade of First Lieutenant:

Simon Francisco, Tecson, D. D. S.
Gregorio Raiz Mateo, D. D. S.
Jose R. Francisco, D. D. S.
Joaquin Ladao, D. D. S.

All these appointments dated from June 23d, 1917. Ladao never qualified, and in his place, on September 24th, Crispulo Layoc, a graduate of the dental school of Santo Tomas University, was appointed and he qualified. The dental corps remained thus constituted until the opening of the Officers' Training School at the Port Area, Manila, July 5th, 1918.

In connection with the general instructions given by the Medical Department, the writer also prepared a course of instruction for the dental corps, and while himself taking such general instruction in military science as time permitted, served in the capacity of instructor of the dental corps. During the three months' course of instruction, the following dentists were in attendance, or on the rolls, with the results noted in each case:

Alona, Gregorio, attended the school, commissioned captain, on duty until February 19, 1919.

Montinola, Gil, attended school, commissioned captain, on duty until February 19, 1919.

Romero, Alfredo, attended the school, commissioned captain, on duty until February 19, 1919.

Borromeo, Téofilo, attended the school, commissioned first lieutenant, on duty until February 19, 1919.

Colet, Manuel, attended the school, commissioned first lieutenant, on duty until February 19, 1919.

Cuesta, Ignacio de la, attended the school, commissioned first lieutenant, on duty until February 19, 1919.

Deala, Juan, attended the school, commissioned first lieutenant, on duty until February 19, 1919.

Buendia, Florencio, attended the school, commissioned first lieutenant, on duty until February 19, 1919.

Asunciôn, Vicente, attended the school commissioned first lieutenant, on duty until February 19, 1919.

Marquez, Adriano J., attended th school, commissioned first lieutenant, on duty until February 19, 1919.

Madria, Juan, attended the school, commissioned first lieutenant, on duty until February 19, 1919.

Sanchez, Pedro, attended the school, commissioned first lieutenant on duty until February 19, 1919.

Sanchez, Angel, admitted at the close of the school, commissioned first lieutenant, on duty to February 19, 1919.

With the exception of the last named, (Angel Sanchez), the above named dentists entered the Officers' Training School, in July, 1918, served during the one month's federalized period, and then until the demobilization of the Philippine National Guard, on February 19th, 1919.

The following were connected with the service at one time or another, with the result as noted in each case:

Tecson, Simon Francisco. 1st Lieut. Was obliged to resign as his duties in the University of the Philippines made it impossible for him to remain with the National Guard.

Mateo, Gregorio Raiz. 1st Lieut. Never qualified, resigned after a short time in the school.

Layoc, Crispulo. 1st Lieut. Resigned after being in the school a short time.

Ladao, Joaquin. Appointed 1st Lieut. Never qualified.

Andrade, Ignacio. Remained in school, was appointed first lieutenant, but resigned on account of impaired health.

Sauco, Pedro. Attended the school, but not being entitled to practise dentistry in the Philippine Islands, could not be commissioned.

Cruz, Dominador. Permitted to withdraw on account of illness.

Cross, Cornelius T. Attended infantry school, then asked to be transferred to the dental corps, was appointed captain, never qualified and finally resigned.

Dental Survey.

The teeth of the officers and enlisted men were examined at various times, for the purpose of studying the condition of the teeth of the Filipinos, and to ascertain the amount of dental services that might be required, and also to enable the dental corps to give such instruction and advice, and to render such services as the circumstances might require.

Three surveys were made, as follows:

1. During the training period for officers and a model company, in 1917, when 305 were examined and the condition of their teeth was recorded. A report of this survey is on file with the Adjutant General of the National Guard.

2. An examination of the teeth of those attending the Officers' Training School in 1918, when the teeth of 886 were examined, the conditions were tabulated and the report placed on file with the Adjutant General.

3. An examination of the teeth of 8,131 enlisted men at Camp Tomas Claudio, in January, 1919. A report of this examination has also been placed on file with the National Guard.

It is not necessary here to detail the results of these examinations, except in

a general way. Suffice it to say, that the work was exceedingly interesting, instructive, and considerable information was gleaned which has been used for the benefit of the men, and will continue to be used by the dental profession for the benefit of the people of the Philippine Islands.

The grand total of all examined was 9,322. The principal and immediate purpose in all these surveys was to find the proportion of sound and carious teeth, and this was found to be thus:

Total number of sound teeth	243,741
Total number of carious teeth	35,432
Total number of all teeth examined	279,173

Dental Hygiene.

So far as possible, the enlisted men were given instruction in dental hygiene. This was accomplished by introducing toothbrush drills, and the men were taught how to care for their teeth. It is gratifying to state that practically all the men of the Division provided themselves with toothbrushes and tooth paste or powder, and while many of them, in fact nearly all of them, had never used a toothbrush, they took an active interest in the instruction given them, and it is believed that this instruction has left a lasting impression. These toothbrush drills are interestingly illustrated by the nine photographs accompanying this paper.

Thru the courtesy of the Florence Manufacturing Co., of Florence, Mass., the writer, in his capacity as Secretary of the Board of Dental Hygiene of the Philippine Islands, obtained a number of child's size Prophylactic toothbrushes. Of these, 1,235 were distributed during the last days of the training period to such men who had children at home of about the age of six years.

Also, thru the courtesy of Wm. H. Anderson & Co., sole agents in the Philippine Islands for Colgate & Co., of New York, 1,235 tubes of tooth paste were distributed to the same men to whom toothbrushes were given. These articles have been taken home by the men, into all parts of the Archipelago, and they are teaching their children the manner of cleaning the teeth as they themselves have been taught.

Dental Services.

From the very beginning, it has been the aim of the dental corps to provide dental services to all the men. To be always ready to give relief, and thus keep the command dentally fit for any service that may be required.

During the training period for officers and the model company, in 1917, there were no facilities at the Port Area, nor instruments on hand to have a clinic at the camp, but the writer treated those who were in urgent need, at his own office. A report of this work is on file in the office of the Adjutant General.

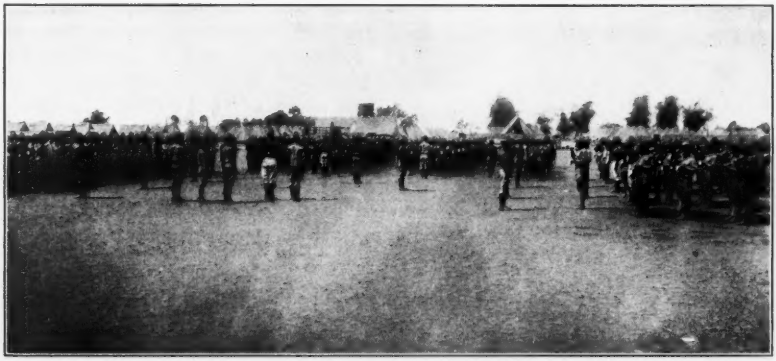
Shortly after the Officers' Training School was established at the Port Area, Manila, a dental clinic was equipped; this was moved to Fort McKinley, Rizal, when the troops were ordered there, and finally transferred to Camp Tomas Claudio. At the time of the federalization of the National Guard, the United States Army furnished three equipments for that many dental officers at the training camp. Unfortunately, these were not available until late in December, 1918, so that the three clinics were not in full operation until the end of that month, and all were continued in full operation until February 10, 1919.

In all these clinics during the various times named, the following is a nutshell report of the work performed:

New visits to the dental clinics	1,451
Revisits to dental clinics	2,728
Total number of visits to the dental clinics	4,179
Number of treatments	2,697
Number of extractions	578
Number of fillings inserted	274
Repair of one bridge	1
Total of all operations	3,550

A Generosity Acknowledged.

At the time when the war was on in full force and there was possibility that the Philippine Division might see active foreign service, the writer approached a personal friend, Mr. Ed Chesley, of the Cristobal Oil Company, for a donation for the purchase of a fully equipped dental ambulance for the use of the dental corps. Mr. Chesley generously donated the sum of $5,000 for that purpose, and opened a credit at the Philippine National Bank in favor of the Philippine National Guard in that amount. However, the end of the war by the signing of the armistice, did not make it necessary for the Division to avail itself of this generous offer.

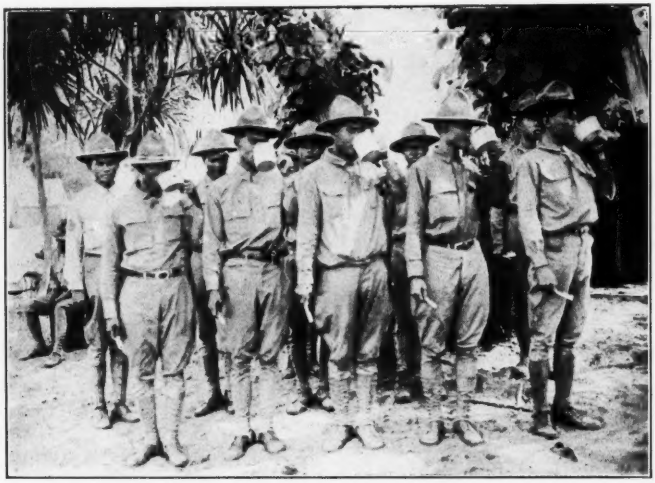


PHILIPPINE NATIONAL GUARD, 1919.

1. The entire Division, consisting of over 10,000 men, received instruction in the correct manner of brushing the teeth. Here is the Fifth Regiment, under command of Colonel Reuben N. Perley, approximately 1,000 men, commencing the daily toothbrush drill.

2. Here is the drill in detail. First position. Bugle calls: Ready!

3. Command: Brush teeth. Outer surfaces. Left side. The instructor counts 20; right side 20; front 20. Grinding surfaces. Above, left side 10; right side 10. Front teeth. Above, inside 10. Grinding surfaces. Below. Left side 10; right side 10. Front teeth below, inside 10.



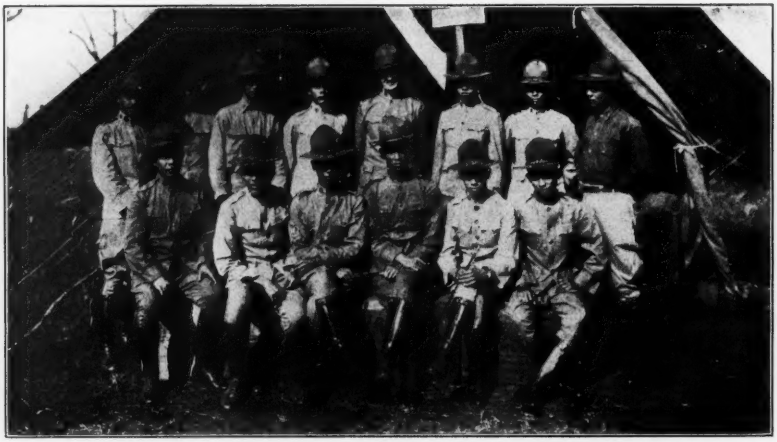
4. Command. Rinse the mouth, spit out; rinse again, spit out.

5. Command: Wash your brush!

6. Command: Shake brush, one —, two —.

7. Command: Three.

8. Command: Throw out water. Right face, March!



DENTAL CORPS.—PHILIPPINE NATIONAL GUARD.—1918-1919.

9. Standing, from left to right: Lieutenants De la Cuesta, Asuncion Colet and Deala; Major Ottofy; Lieutenants Marquez, Madria and Pedro Sanchez. Seated, from left to right: Lieutenants Angel Sanchez and Borromeo, Captains Montinola, Alona and Romero; Lieutenant Buendia.

PRESIDENT'S ADDRESS.

By G. Walter Dittmar, D. D. S., Chicago, Ill.

(Read before the Illinois State Dental Society, March 22-25, 1920.)

IN REVIEWING the record of this organization, and noting the standard which directed the activities that culminated in placing the organized dental profession of this state in an enviable position, and noting further the long list of earnest workers, whose untiring efforts and sincere devotion to the cause of dentistry have aided greatly in elevating it to the level of other learned professions—it is with pardonable pride that we call attention to the past fifty-five years, and the remarkable achievements of this society.

Founded as it is, upon sound principles, and prompted by unselfish motives, its primary object, as stated in Article II of our Constitution, "Shall be to promote the public welfare by the advancement of the dental profession in education, science, mutual fellowship and good feeling; by bringing into one compact organization all of the dental societies of the state; by advocacy of proper legislation and by cooperation with the medical profession in all matters of mutual interest, and advantage to the people of the state."

Your president could find no theme more fitting to discuss than a part of Article II; and of the numerous topics therein mentioned, he will confine himself, first, to the subject of "promotion of the public welfare," and, second, "the advocacy of needed legislation."

Promotion of the public welfare—as far as our profession is concerned, means primarily the promotion of the status of health which may be impaired by mouth infections.

This promotion is directly dependable upon the amount and degree of scientific knowledge our profession has attained; and the information with reference to the prevention of oral disease that has been assimilated by the general public.

We are confronted with the appalling fact that fully 95% of the mouths of all children of school age are diseased.

We also know that mouth infections lead to serious systemic disorders, both nervous and organic.

It is also a fact that clean teeth do not decay, and while most oral diseases are amenable to treatment, it is plainly evident that prevention of dental disease is the goal which our profession should strive to attain.

The arch enemy of the teeth is dental caries. If this disease could be prevented, the greater part of the inflammatory and suppurative disorders, which so often result in alveolar abscesses and chronic suppurative pericementitis or so-called pyorrhea alveolaris, and their train of systemic infections, would never occur.

The logical means to prevent this almost universal disease would be to supply the human organism with the proper antibodies; or else a stimulant which would cause the system to produce these antibodies.

Whether this be done by a properly prepared and balanced diet supplying the system with the needed vitamines, or

the inoculation of live or dead bacteria, chemicals or what not—it is my earnest hope that some day some remedy can be administered to the child, which will produce an immunity to dental caries.

It is evident from reliable statistics obtained from many sources that from three to five per cent of children possess a natural immunity to dental caries. We, as dentists, know that in most mouths an immunity gradually establishes itself. We also notice that mouths that have become practically immune, become, at times, violently susceptible again, due, no doubt, to some metabolic disturbance. In turn, the disease in these mouths may again gradually lessen and cease.

A fact is evident, and that is that some element, some substance antidoting dental caries, is possessed from infancy by a very small per cent of humanity, and that in a very large per cent of the remainder, this element or substance is gradually developed. What is this substance? This antibody? And how can it be produced? Surely some scientifically trained mind will solve this problem and earn the distinction he will so richly deserve, namely, be classed with the world's greatest benefactors.

Today, while we are eagerly and prayerfully looking for the ascension of this brilliant star, we unfortunately are forcibly reminded of the conditions which actually confront us and we must, therefore, endeavor to make the best of them on the basis of our present knowledge.

Note—a few simple facts.

The late Doctors Black and Miller have proved conclusively that dental caries is a disease produced by bacteria. Carbohydrates—(starches and sugars) are converted by these germs into acid. In protected places on the teeth where the acid can become sufficiently concentrated, it will attack and dissolve tooth substance. Cavities form, and if not properly excavated and filled, the tooth usually aches and finally the pulp dies. The dead pulp putrifies, and often infects the apical tissues, resulting in an alveolar abscess. From this, systemic infection is likely to follow, which may be most serious.

A natural sequence.

Teeth are lost—normal contact lost—food packs between teeth and injures or destroys septal tissues. Migration of teeth; peridental membrane injured, infected and partially destroyed, and again a condition prone to systemic infection.

In neglected cases—much suffering. Improper mastication of food. Faulty nutrition. Disease carriers.

The result: A seriously impaired man and womanhood—an incalculable loss to a nation's efficiency.

The medical examinations conducted by the Army and Navy during the recent great war revealed, as nothing ever did before, the impaired health conditions of the men of military age due to oral infections. Bad teeth caused a large percentage of the rejections. The government felt it could not permit men with deficient or badly diseased teeth to enter its military organization. Instead of being, as they properly should, an asset, these men were considered a bad risk and rejected. To such an extent did bad teeth impair the nation's fighting forces, that the Surgeon General's office, and the Chairman of the General Medical Board of the Council of National Defense, decided that the army could not be most efficient without a well-organized dental corps. The glorious achievements accomplished in the organization of that dental corps need no recounting in this address. I cannot refrain, however, from mentioning with pride the name of one man who performed a Herculean task for the welfare of our soldiers—a man who gave unselfishly his great ability, whose energy and leadership culminated in the rendering of a service, primarily to our Army and incidentally to our profession. That man is our honored fellow-member and friend, Col. W. H. G. Logan, past

chairman of the Dental Committee and member of the Council of National Defense of the United States of America.

The deplorable condition of the mouths of the men who, during the war, were of draft age (and what is true of the men, it is safe to assume is to a greater extent also true of the women) has brought our profession to a realization that we must thoroly organize and strike at the head of this dangerous and unhealthy condition of our people.

I am not unmindful of the fact that many men in the dental profession, and a small part of the medical profession, have long realized the importance of healthy mouths; also that most valuable service has been rendered by the Oral Hygiene Committee of the National Dental Association. Such men as Dr. Richard Grady, of Annapolis; Dr. Corley, of Swanee, Tenn.; Dr. Ebersole, of Cleveland; Dr. Thompson, of Washington, D. C.; Dr. Dameron, of St. Louis, and the late Dr. White, of Phelps, N. Y., should be mentioned as active and faithful workers on the first national committee.

There are hundreds of men and women in our profession who have rendered yeoman service and contributed much to the propaganda of mouth hygiene. The editors of our dental journals—in particular The Journal of the National Dental Association, Dental Cosmos, and Oral Hygiene—have kept our profession awake to its duties. The public press, during the past few years, has served the people commendably in publishing educational articles. Thru the agency of lectures before clubs and societies, the moving picture film, the establishing of numerous free dental clinics;—interesting philanthropists like the Forsyth Brothers, who presented the magnificent Forsyth Memorial to Boston, and Mr. Eastman, who gave a similar institution to Rochester,—the excellent work the United States Public Health Service is doing, and the accomplishments of the Public Service Commissions of numerous dental societies—all have done much toward furthering the oral hygiene movement.

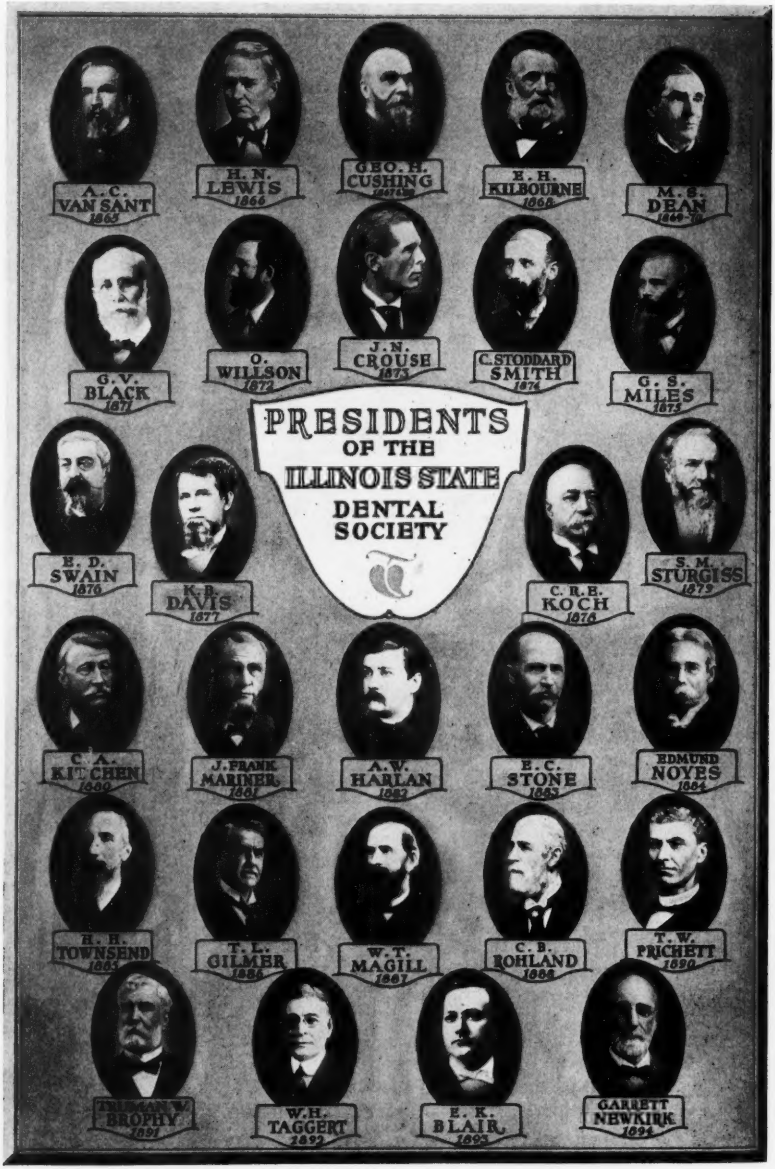
In this connection permit me to call attention to the splendid effort made in Illinois, and to give credit to those men and institutions that contributed so liberally to this great cause. All these agencies need to continue disseminating knowledge, their number should be multiplied many times—to them other and more potent forces must be added that the gospel of clean mouths and clean teeth can be impressed upon every individual in this land.

This brings us to the question: *What are these more potent forces that must be added?*

Our government in establishing the public school had as its primary object the making of safe, useful and patriotic citizens. Our Republic would not long endure without its system of public schools. It is its principal safeguard. Thru it great reformations can be worked. When the Women's Christian Temperance Union some years ago succeeded in getting the text books in physiology to add a chapter on the effects of alcohol on the human economy, and then in having these text books adopted by the public schools of this nation, the doom of the liquor traffic was sealed—it was only a question of time.

The preliminary work done by the pioneers in the oral hygiene movement is analagous to the preliminary work done by the temperance organizations some years ago—the latter converted only a few of the people who had fixed habits, but the child in school who is so susceptible to the influence of teachers, learned that alcohol is not necessary for his welfare, and that it caused much poverty, disease, misery and death. Object lessons were in evidence in every community.

In like manner can the public school be made the most potent agent for the proper dissemination of the simple truths


PRESIDENTS
OF THE
ILLINOIS STATE
DENTAL
SOCIETY
A. C. VAN SANT 1865
H. N. LEWIS 1866
GEO. H. CUSHING 1867
E. H. KILBOURNE 1868
M. S. DEAN 1869
G. V. BLACK 1871
O. WILLSON 1872
J. N. CROUSE 1873
C. STODDARD SMITH 1874
G. S. MILES 1875
E. D. SWAIN 1876
K. D. DAVIS 1877
C. R. E. KOCH 1878
S. M. STURGISS 1879
C. A. KITCHEN 1880
J. FRANK MARINER 1881
A. W. HARLAN 1882
E. C. STONE 1883
EDMUND NOYES 1884
R. R. TOWNSEND 1885
T. L. GILMER 1886
W. T. MAGILL 1887
C. B. ROHLAND 1888
T. W. PRICHETT 1890
BROPHY 1891
W. H. TAGGERT 1892
E. K. BLAIR 1893
GARRETT NEWKIRK 1894

and practices in relation to mouth hygiene.

We fully realize that much harm often is done in the mouths of children before they attain school age, and it would be most desirable to administer to these children when very young—yes, even before they are born, by caring for the mouths of their mothers. How can a neglected mother whose system is infected from unhygienic oral conditions, who cannot properly masticate her food, who is anaemic and diseased, be expected to produce strong and healthy children?

While, no doubt, the oral hygiene propaganda which is spreading the gospel of clean mouths by means of the various agencies before mentioned, will promote to a very great extent the welfare of the people—still the public school is undoubtedly the most direct and most effective avenue thru which the desired results will eventually be obtained.

It is a laudable fact that for some years past some attention has been paid to the physical welfare of the children in the public schools, especially in the larger cities. The health departments of such cities have provided physicians and nurses, and in some instances they have also provided dentists to examine the mouths and render dental service.

Chicago and some of our larger cities have conducted a few free dental infirmaries, but the children in the smaller cities and towns, and those residing in the rural districts are not favored with such service.

Our state could render no greater service to its future men and women than to provide properly regulated compulsory dental examinations for every child of school age, and for the indigent poor provide in every community a means by which such children will receive sufficient attention to make them as nearly as possible healthy and useful citizens.

The state of Kansas, which is a leader in progressive movements, has recently placed in its statute books a law making the examination of the teeth of all its school children compulsory.

Dr. Florence B. Sherbon, director of Child Hygiene of the State of Kansas, says:

"The law requiring free dental inspection in all the public schools of Kansas makes possible four important results.

1st. Immediate benefit to the health of the children treated.

2nd. Effective education of the children in practical dental hygiene.

3rd. The securing of statistics which will reveal present conditions.

4th. The compilation of data for a basis for future methods of procedure."

Concluding the article recently published in the Bulletin of the Kansas State Board of Health, she further says: "When the results of this combined dental and physical inspection of the school children of Kansas are summed up, it will make one of the most valuable pieces of health research undertaken in any state and will furnish unique and important data which will serve as a guide in future health work."

Why should not the great and wealthy state of Illinois enact a similar law? There can be no question but that every state in the union should. It would be the most paying investment this nation ever made. Your President, therefore, recommends that the Committee on Legislation of this Society prepare and present to the Illinois legislature at its next session, a bill providing for free dental examinations for every child in the public schools in the state. Certainly the value of such a bill is evident, and we believe it would pass the legislature unanimously. (The support the Legislature has accorded our profession in matters of dental legislation in recent years is highly commendable—the reason being that we have been unselfish in our demands and asked only for measures which were fair and just.) Certainly our profession could not be indicted for

PRESIDENTS
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DENTAL
SOCIETY
J. W. CORMANY 1893
W. A. STEVENS 1896
C. R. TAYLOR 1897
J. A. W. DAVIS 1898
CHAS. P. PRUYN 1899
R. N. LAURANCE 1900
J. G. REID 1901
M. L. HANAFORD 1902
A. H. PECK 1905
F. H. McINTOSH 1904
C. N. JOHNSON 1905
S. F. DUNCAN 1906
B. McWHINNEY 1907
W. A. JOHNSTON 1908
ARTHUR D. BLACK 1909
E. H. ALLEN 1910
DONALD M. GAILLIE 1911
C. C. CORBETT 1912
J. F. WALTZ 1913
WM. H. G. LOGAN 1914
J. M. BARCUS 1915
J. P. BUCKLEY 1916
H. L. WHIPPLE 1917
J. E. HINKINS 1918
L. B. TORRENCE 1919
G. WALTER DITTMAR 1920
JOHN F. LUTHRINGER 1921

fostering selfish motives when it is so evident that mouth examinations, mouth hygiene teaching, and proper dental care given to children will prevent the train of so serious, dangerous and costly consequences.

Now comes the question: *What must we, as a profession do to prepare ourselves properly to meet the demands which will be made of us?* As I view it, there are a number of things which must be done conjointly with the enactment of the desired law above mentioned. The *first* of these is to *standardize oral hygiene teaching in our dental colleges.* That should really be done thruout the entire nation. Some competent authority should be delegated to write and have properly illustrated a text book on the "Care of the Teeth and Mouth." This should be done under the direction of the Oral Hygiene Committee of the National Dental Association. *Second,* this text book should be adopted by the American Institute of Dental Teachers and used in every dental college in America. *Third,* a bill providing for the educating and licensing of dental hygienists who shall be so educated that they will be well qualified to properly examine and clean teeth, and to teach individuals how to practice oral hygiene. Such dental hygienists should be placed in the various public and private institutions that are approved by the Department of Registration and Education. Their activities in these institutions should, of course, be supervised by licensed dentists, or a commission which includes a licensed dentist so that proper service will be rendered.

A number of states now have laws, licensing dental hygienists—viz; New York, Massachusetts, Connecticut, Oklahoma, Michigan, Minnesota and Colorado. And there may be others.

Another potent agency, it seems to me, which our Public Service Commission should interest in this cause, is the office of the Superintendent of Public Instruction. Thru that office let there be instituted a campaign to instruct the public school teachers. This could be done at teachers' institutes and teachers' meetings by supplying literature and lecturers on mouth hygiene. Every teacher in the state should be instructed in the details of mouth hygiene and compelled to give the subject attention in the classroom. This would have a wholesome influence on the children. The placing of a lesson in each public school reader—very simple and plain in the first reader, and more advanced in each succeeding year—would aid in keeping the subject before the child and with supplementary instruction given by the teacher, and occasionally by a dental hygienist or dentist, the child would be so impressed that he would intelligently practice mouth hygiene.

The younger the child who is taught how properly to clean his teeth, who unfailingly and systematically cleanses his teeth, the less harm will result to the teeth, to the surrounding tissues, and to the child's general health.

A logical campaign of action for caring for children under school age as well as for those of school age was presented in a report prepared by the Public Service Commission of the Chicago Dental Society, and submitted to the Committee on Health of the Chicago Board of Education:

The report bearing date of April 21, 1919: Said commission consisted of Drs. Thomas L. Gilmer, Truman W. Brophy, C. N. Johnson, Arthur D. Black, and James P. Smith, chairman. While the report deals in a thoro and exhaustive manner with the needs of dental care for the children of this city and surrounding country, pointing out a plan of procedure and giving consideration to the probable financial requirements, it is the method that was recommended for the care of these children that I desire to submit, viz:

For children under six years of age:

Thru the cooperation of the Child Welfare and other social service agen-

cies of Cook County, and the Public Service Commission of the Chicago Dental Society, every organization in contact with children under six years of age to be utilized in a campaign of education and direct instruction in mouth hygiene.

1. By the establishment of pre-school health centers, in every-day nursery, community center, etc. Dental hygienists should examine and clean the teeth of the children, teach mouth hygiene, give toothbrush drills, etc. Reparative dental service should also be arranged for.

2. By the liberal use of educational literature, to inform parents of the importance of care of the temporary teeth, and to urge that mouths be examined by practicing dentists or dentists at day nurseries.

3. By distributing similar literature to children in the public schools to be taken home so that mothers of younger children will be reached. Money so expended will result in much economy in the care of the mouths of these children after they enter public schools.

4. By public lectures in community centers and public schools, these to be part of a general scheme of health lectures.

SECOND.

For children in the public and parochial schools.

(a) *Prevention.*

1. Thoro examination of the mouths of all the children at least twice a year.

2. Cleaning the teeth of all the children by dental hygienists at least twice a year.

3. Require each child to have a toothbrush. Supply brushes free to all who cannot buy them.

4. Toothbrush drills and short talks by dental hygienists.

5. Distribution of literature for education of children and their parents relative to the importance of proper care of the teeth and the consequences of lack of care.

6. Public lectures to both children and parents in the school buildings, these to be a part of the general scheme of health lectures.

(b) *Dental Care.*

1. Memoranda to parents of services needed, urging treatment.

2. Classification of dispensary and non-dispensary cases.

3. Free dental service for those who cannot afford to pay.

THIRD.

For Rural Schools in Cook County.

Same provisions as for Chicago schools; the dental service being given by an automobile dispensary. Regular dental clinics should be established in the health centers conducted by the Public health division of the County Bureau of Social Service. Dentists in these districts should, for a time at lease, give gratuitous service in cooperation with the service contributed by physicians.

FOURTH.

Statistics.

1. A scheme of records should be worked out by which the dental examinations and records would become a part of the medical examinations and records of the child and yet keep a separate (duplicate) record for use by the Dental Service.

2. The scheme should provide for a record of each child in mouth hygiene (to be entered on the regular scholastic report card if practicable); also of the mouth condition each year, and the treatment, all in such form as could be tabulated with reference to the child's general, medical, scholastic and attendance record.

This, it would seem, is a well-digested plan, and it is earnestly hoped it will be adopted. It also suggests a working basis for the smaller cities and towns and

rural districts whose needs are more urgent than are those of the larger cities.

Results which have been obtained in numerous experiments made in the public schools thruout several of the states of this nation, the most notable of which are those conducted in the schools of Cleveland, Ohio, by Dr. W. S. Ebersole; and in the schools of Bridgeport, Conn., by Dr. A. C. Fones, where the improved health conditions and decided advance in scholarship made by groups of children that had received proper dental care compared with similar groups of children that had not been so cared for, convincingly demonstrated the fundamental importance of oral hygiene as a decided economic, as well as a public health measure.

May I, therefore, urge that the organized dental profession of this state be a unit in supporting legislation which will create properly educated and licensed dental hygienists that may be employed by the authorities of schools, hospitals and other institutions, whether public or private, which are approved by the Department of Registration and Education? Also create and maintain free dental inspection of the children in the public schools in this state along lines similar to House Bill No. 323 enacted recently by the state of Kansas?

In addition to this, there are other sorely needed amendments to our dental law. In fact, an entirely new Dental Practice Act should be enacted. It will be impossible in this address to point out what, in my opinion, should be done regarding the details of a new dental law. There are, however, several fundamental matters which our profession should carefully study and for which they should finally prepare a remedy.

In 1917 Governor Frank O. Lowden succeeded in having enacted "The Civil Administrative Code of the State of Illinois." This instrument is conceded to be a masterpiece in the administration of state government.

It simplified and made more efficient the state's numerous governmental activities.

It also made it more economical for the state to administer its laws.

Over one hundred unrelated and more or less "independent" state agencies were centered into nine departments of state government, viz:

The Department of Finance.
The Department of Agriculture.
The Department of Labor.
The Department of Mines and Minerals.
The Department of Public Welfare
The Department of Public Health, and
The Department of Registration and Education.

It is the latter department which concerns, more in particular, our profession, for the department of Registration and Education administers the laws of all the "regulated" professions, trades and occupations; it is vested, subject to the provisions of the "Code," to exercise the "rights, powers and duties," previously vested by law in the Board of Education of the State of Illinois, the Board of Trustees of the various State Normal Schools, the State Boards of the several "regulated" profession, trades and occupations, and numerous other activities as enumerated in section 58 of the "Code."

Its enactment consequently voided several whole sections and parts of other sections of our dental law, and though it provided in general terms for the administration of laws and rules affecting our profession, in the same manner that it provided for the other professions, trades and occupations "regulated," it has left it to the professions, trades and occupations, the several laws of which are devolved upon the department for administration, to so amend and amplify their several laws, that these professions, trades and occupations will be properly regulated and the people of this commonwealth sufficiently safeguarded.

The "Code" in its phraseology providing for the administration of the laws of twelve widely different professions,

trades and occupations, necessarily had to be general in its application—it could not well be otherwise.

Quoting from the report of Attorney General Edward J. Brundage to Governor Lowden, 1917-18, with reference to the Civil Administrative Code, the Attorney General says, "altho an important piece of legislation, it is of necessity of a very general nature, conferring broad powers upon the newly created departments. By reason of the very nature of these powers and from the fact that the newly created departments were required to develop novel organizations, it early became evident that the law pertaining to each department should be ascertained and compiled."

There can be no question but that the members of our profession should carefully study the present needs of dentistry and dental education and that the Committee on Legislation from this organization, should draft a comprehensive and equitable bill and present it to the next legislature.

Regarding our coming constitutional convention, permit me to point out that Illinois, whose population has grown from forty thousand when she was admitted to statehood in 1818, to over seven and a quarter millions, when she celebrated her centennial, and whose recent census we are safe to assume will report over eight million people, Illinois, who has again forged ahead and now stands in the lead of her sister states in farming and general manufacture, who ranks as first with New York, Pennsylvania, and Massachusetts in education, and who takes second place in the Union in trade and commerce, Illinois, whose achievements in the various educational, industrial, agricultural, commercial and political activities, has produced the second largest city in the United States, whose rapid growth has gotten far beyond the provisions of our state constitution enacted in 1870, has happily provided for a constitutional convention.

The convention drafting the provisions for a new constitution is now in session.

Every citizen of this state should take a deep interest in the forthcoming new constitution, and we, as professional men and women, should thoroly inform ourselves that we may intelligently discuss this new and important instrument when it is submitted to the voters of this state.

In closing, permit me to express my sincere appreciation to the officers, committees and councillors who have so earnestly labored for the welfare of this society during the past year. This society thru its component organizations—27 in number—each holding from two to nine meetings during the past year, or to be more exact, the "downstate" organizations held 99 meetings with a gross attendance of approximately 3000 dentists and our largest component, the Chicago Dental Society with its five branch societies held 37 meetings with a gross attendance of 5170 dentists—a total of 136 dental meetings with a gross attendance of 8170, exclusive of our annual big meeting. This speaks well for dental activities in Illinois.

It has been a remarkably pleasant year—the executive council and various committees all working harmoniously with the executive officers for the welfare of the society. The various committees will, during the meeting, submit their reports, all of which will merit your close attention. I desire to call special attention to the following reports.

The Committee on Legislation, which will report its activities with the last legislature and the result of those activities; the Committee on Law, which will present a plan for indemnity insurance of our membership, which on the surface appears to be a most excellent plan and the Public Service Commission, which has lent its energies to further what I believe to be the most important task, we, as a profession, must face—viz; effective mouth hygiene, teaching and practice.

Our secretary, Dr. Luthringer, de-

serves the highest appreciation, and thanks of each member of this organization. No official was ever more loyal, active or sincere. He has been ever watchful of the society's best interest, and anxious to do everything possible for its advancement.

In conclusion, I desire also sincerely to thank the membership for electing me to the highest office in this society, an honor which I keenly appreciate. I trust that you and each one of our guests will thoroly enjoy what has been prepared for you by the program and clinic committees, and also by the committee on local arrangements.

Our guests—I wish to assure you that not only will you be warmly welcomed to attend our annual meeting each year, but you will also be welcome at any of the meetings of our numerous active component societies whenever it chances to meet your convenience to attend. (Applause.)

DISCUSSION.

C. N. Johnson, Chicago.

In speaking of the probable prevention of dental caries, the president made the statement that we might look at sometime for a serum that will prevent dental decay. That is very devoutly to be wished. I remember discussing this many years ago with the late Dr. G. V. Black. I had written an editorial on it in 1894, and I made the statement then that the time might come when we could use vaccination for the prevention of dental caries just as we were vaccinating for the prevention of smallpox. I was held up to some ridicule at the time, but I felt much better when Dr. Black took me to one side and said: "My boy, you are not so much astray after all; that time may come."

We are not much nearer to that consummation than we were in those days. Even if we were, we would not prevent dental diseases at once. Suppose tomorrow a serum should be invented that would actually stop dental decay, it would take a long time to get the profession generally and the public conversant with it, and it would take a longer time to bring it into practical use. And so today we cannot count much on anything of that kind in order to meet the situation as it confronts us. The most tangible thing we have to work upon is the subject of oral prophylaxis, and I am glad the Chairman of the Program Committee has made that a prominent feature of the different sessions that will be held. It is the significant question today—the question of oral hygiene.

In this movement it seems to me the greatest thing that we have to think about is not so much the filling of teeth of these poor children and of curing disease as it is their education toward those means by which these diseases may be prevented. We cannot hope by our own intervention to prevent these diseases, but we can educate the people so that they can prevent them, and we can accomplish definite results as illustrated in various communities.

Last May I visited Boston and the Forsyth Dental Infirmary. I was very much impressed with what I saw there. I want to pay a tribute to the Forsyth Dental Infirmary and to the Rochester institution, and particularly to Mr. Eastman and to the Forsyths. In the Forsyth Infirmary I was greatly impressed with the wonderful equipment and the splendid care taken of the children, looking at all times to their comfort, and there was one thing which seemed to me more significant than any other and it was this: When I went to a little room down stairs there were two young ladies who had a line of children standing up and were putting them thru a toothbrush drill, and then taking these children one by one and making an inspection, and a report, and tabulating that report to see what attention had been given to the previous instruction. It was very gratifying to see one little child walk up and receive a badge of some kind; it was a

recognition of the fact that the child had listened to the instruction and had cared for her teeth. It is the education of the children so that they may, by their own efforts, accomplish this matter of prevention.

I am inclined to think in smaller communities greater advances may be made along these lines than we are able to do in these large communities. I have had some experience, and some of my friends have had more experience in the meeting of this situation in our own city. I think probably Dr. J. P. Smith can tell you something about that, but I am going to contrast what the Health Commissioner of the City of Chicago said this morning with something that has happened in another community I am familiar with.

Away down in the South Seas there are two islands which are called New Zealand, in which there are about a million people, whereas, here in the City of Chicago we have more than two million. In New Zealand the state takes charge of the teeth of the children up to a certain age. Our friend, Colonel Rishworth, of Auckland, New Zealand, was passing thru from Europe to his home a year ago, and he stated that his plan was to go before Parliament and request an appropriation to this end, that the state should take care of the teeth of the children up to a certain age, regardless of the financial standing of the parents. He said that the state should hire dentists and hold them responsible for the condition of the teeth of the children.

I received a letter from him a short time ago in which he tells me that has been accomplished, and the state is going to see that the teeth of the children of New Zealand are kept in good condition till such time as they have learned how to care for them and to go to their own dentists. This is the most significant thing that has happened in connection with the movement of oral hygiene. It was suggested to Colonel Rishworth that they might appropriate $200,000.00 a year. He said to me: "I am not going to listen to that; that won't be enough; the smallest appropriation should be half a million dollars," and he writes me that the work is now under way. (Applause.)

We listened a few moments ago to the Health Commissioner of the City of Chicago, which has over two million and a half of people. The City Council, he told us, is in session today and it has conceded to appropriate $5,000.00 for dental service. I was never so ashamed of the City of Chicago as I am at this moment. If it had not been for the generosity of the private citizens of Chicago, dental hygiene would not have been introduced in the public schools here.

The President made a statement which has pleased me very much in regard to legislation for which the Illinois State Dental Society has asked. Regarding any legislation we have gone to Springfield about, we have always had a respectful hearing. There is a good reason for that. We have never asked for legislation for ourselves as a profession. If any legislation of that kind should be introduced I would be opposed to it myself. We do not need legislation, but the people of this state need it to protect them against dental abuses. We need the best kind of legislation in connection with the Dental Practice Act. I believe we must have a new law, and when we formulate a law that is equitable, that has for its purpose the welfare of the people of the state, I do not believe we will have any trouble in passing it.

I second what the President has said in regard to the new state constitution. Every member of the dental profession should study it when it comes out. We in the past have held ourselves too much aloof from public affairs. This new constitution will mean much to every individual citizen of Illinois. As intelligent men, we must know something about it. We may be able to do some good, and to make some suggestions.

I want to utter a cordial word of welcome, in addition to what the health

commission of the city of Chicago has said, to those who have come here from long distances. We feel complimented. We feel they have sacrificed time and convenience, and we want them to know that we, of Illinois and of Chicago, are glad to have them with us. We hope they will enjoy themselves, and that we may be of service to them while here. We hope they will feel in attending the sessions of the Illinois State Dental Society that they are among their friends. (Applause.)

Arthur D. Black, Chicago.

I am sure that everyone who heard the address of our President this morning has a broader vision of the duties of dentists than he had before. There has been intermingled with the problems in which we are most directly interested, these other problems of civic duty which are so closely related, that we must perforce be interested and be active along both the professional and civic lines suggested in this splendid address.

Whenever the question of public education as a means of promoting hygiene is presented, my thoughts always go back to the announcement of the Forsyth memorial in Boston at the time of its opening. While we have heard of this institution as being one that was erected to take care of the teeth of the poor children of Boston, we probably have not realized, as we should, the real object of that institution as mentioned in its announcement. It is specifically stated there that the principal object of the Forsyth memorial is not to take care of the teeth of the poor children of Boston, but to promote education in preventive dentistry; and not only to promote that education, but to eventually make it the duty of the state and of the nation to see that its children come to manhood and womanhood with healthy bodies, just as much as it is the duty of the state to see that its children are properly educated. And that is the problem before us today in this address.

We should keep distinctly separate two problems in the larger question of dentistry in our public schools. One is the problem of preventive dentistry, and the other the problem of reparative dentistry. I think we must all agree, notwithstanding the magnificent effort which has been made, that reparative dentistry, as it has been applied to the public schools, has really been a failure, for the reason that we have never been able in any community, so far as I know, to get enough money or enough dentists to accomplish any real good so far as the whole group of children is concerned. We had, here in Chicago at one time, a maximum of fourteen dentists in service for 425,000 children in our schools. That is as far as we have ever gotten in Chicago with reparative dentistry in our schools. In some of the smaller cities the precentage has been better, but never enough. We must come to realize that our success in the handling of this problem depends upon the teaching of preventive dentistry. The man who has accomplished the most for this country in preventive dentistry is the one who is to address us tonight, Dr. Fones, of Bridgeport, Connecticut. I say that with all due respect to other efforts that have been made. After six years in the application of preventive dentistry in Bridgeport, he is going to tell us what has been accomplished, and he will probably present some figures which we can take back to our own communities to convince those who may appropriate funds of the possibilities and real value of this service. I know he has the figures with reference to the reduction of the death rate of certain communicable diseases among children for a period of six years. Dr. Fones will show you that, as a financial problem, it has paid well for the work that has been done in Bridgeport. That is the basis from which we must do our work here in Illinois. The chairman of the Chicago committee, of which Dr. Johnson and I are members, has done

more hard work for the advancement of these problems in the City of Chicago and State of Illinois than any other man of whom I know. I refer to Dr. J. P. Smith. (Applause.)

Dr. Dittmar referred to the program that has been laid out for Chicago. This program, as we presented it to the Health Committee of the Board of Education, suggested the expenditure of about $400,000.00 a year. That money was not appropriated; we did not expect it to be. It will require several years of continuous effort to educate those in authority to the importance of this work. When a sufficient number are convinced, the money will be forthcoming. The problem is just as acute and just as important for cities outside of Chicago. Of course, we see more of it piled together in Chicago, but the problem is the same everywhere. I imagine many of us, in reading what has been written on the promotion of mouth hygiene, have become tired of seeing the same thing over and over again, and as we look around our own circle we do not see that much has been accomplished. That is the way of all such movements. It takes a long time in the matter of propaganda, in the matter of earnest work by a few men before any real action is apparent.

I might disagree with our President in his statement relative to the ease of passing the legislation which we need. I happened to be in Topeka, Kansas, at the time their dental legislation was passed, and I know of no harder fight that has been made by a group of professional men than was made in Kansas to get that mouth hygiene bill thru. I believe we will have just as hard a fight in the State of Illinois to get our bill thru. We will require the support of the members of this organization and of every man whom we can send to Springfield as our representatives and senators, and it will be a hard fight. That is the challenge we have before us today. Is the Illinois State Dental Society going to take that challenge and do the work that is necessary to put it over? I think we will. (Applause.)

Alfred C. Fones.

I have found that practically all dentists, when they have a clear understanding of what dental hygienists when properly educated and trained in this work can do for humanity, become enthusiastic and will support any legislation that will bring about the results we are all working for. I find the opposition comes almost entirely thru a lack of understanding of what these women are to do. Preventive dentistry is a necessity for every human being in the state of Illinois and everyone should have access to it. There is not a dentist with a full practice who can comfortably provide preventive service for his patients—he must have help.

When I first became enthusiastic about the possibilities of prevention, in 1900, I found that it proved to be more than I could cope with in addition to my other work, and in 1904 I trained a woman to do prophylactic work. Since 1907 we have had dental hygienists in Connecticut and, as far as I know, there has never been a case of illegal practice. The law provides that her license may be revoked if she does not confine her services to the operations outlined in the law, and also the license of her employer for permitting illegal practice. There is little danger that women will overstep the line or attempt anything aside from the prescribed service. They are peculiarly adapted to this specialty. In fact, it would be impossible to train men for dental hygiene work and get them to stick to it for four months. A man would never be willing to limit himself to one specialty, while a woman is content to confine her energy and skill to this one form of treatment. She is apt to be conscientious and painstaking in her work, and with children especially, she is a natural teacher. In our municipal relief and

repair clinic, we have been unable to retain the interest of graduate dentists. They have felt that the clinic work for children was very monotonous because there was no crown and bridge or inlay work, or root fillings. They begin at a salary of $1500 a year, but the field of service is so limited that it does not interest them. I know that our problems will be solved by women dental hygienists because women do not find a limited field monotonous, and they are especially conscientious and successful with children's work.

Dr. Johnson said that the City Council of Chicago only appropriated $5,000.00 for health work. I worked four years to try to get $5,000.00 from our Board of Apportionment to make a demonstration of an educational and preventive dental clinic in the schools and the reason I eventually got it was because the President of the Finance Board was a patient of mine, and had been having his teeth cleaned by a dental hygienist in my office. He was so enthusiastic over this preventive treatment that he agreed with me that it would be a good thing to have it for the children in the public schools. There was a personal experience. He had to be educated before he was willing to grant the money of the city to be expended for this purpose in the public schools. It is necessary first to educate public officials before you can get the money. After I got my first $5,000.00 and made a demonstration, reports came in from the school teachers and principals that the results were highly satisfactory. This clinic was not a cinder in the eye of the teaching force in the schools. The hygienists and their equipment were out of the way, and the children did not seem to mind the treatments. Their mouths were cleaned up, and the demonstration was a great success. The next year we were given $10,000.00, and in subsequent years we were given $15,000.00, $20,000.00, and last year $38,000.00. This year we were given $42,000.00 so that we are spending about $40,000.00 a year for preventive dentistry, due to the liberality of the Finance Board, and particularly to one of its members who was so thoroly convinced of the value of the work after a practical demonstration. That is what you have to work for—the chance to get a wedge in, to show what this thing means, and if you can make demonstrations you will get money to carry on the work. You will not get $400,000.00 from the City Council of Chicago for this work at once, for you must educate the people in power to give the money. That is the hardest work of all, but this movement is worth working hard for.

We have been all thru the fire of experience and I would not be interested in this movement for one minute if it were not based on the science of absolute truth and high professional ethics. We are going to have a fine lot of citizens in the State of Connecticut, with the cleanest and nicest mouths you ever saw, and I am devoting my life to that end. You can do it in Illinois or in any other state if you go at it from a preventive standpoint. You must have women to help you, dental hygienists who are highly educated in this work. (Applause.)

FOCAL INFECTIONS AND TISSUE SPECIFICITIES.

By Guthrie McConnell, M. D.

From the Research Institute of the National Dental Association.

(Read before the National Dental Association at Its Twenty-third Annual Session, New Orleans, La., October 20-24, 1919.)

NOT infrequently the desire to employ a brief phrase to include a complicated series of changes leads to a lack of appreciation of the underlying conditions. During the past few years a term that has been much employed, both by dentists and physicians, is that of "focal infection." It has become such common usage that many practitioners have thought of it as being something peculiar, something that in an unknown way differs from the ordinary reactions and results of inflammation. Such is not the case. These lesions have been recognized for years, their etiology and pathology more or less familiar to all. What, however, is comparatively new is the recognition, by the majority of men, of their importance from the clinical viewpoint, in spite of the fact that the serious possibilities were indicated years ago.

The causation of such areas is the same as that which excites inflammation of all kinds. To begin with, there must be an invasion by bacteria with subsequent inflammatory reactions. These are redness, pain, swelling, increase in temperature and altered function. Ordinarily when the tissues become infected the body is able eventually to overcome the invaders and dispose of them, because inflammation is essentially a protective reaction.

It must be remembered that in discussing infection there are at least two great factors to be taken into consideration, the infectivity or virulence of the organism and the resisting power of the host. According to variations in these two there will be differences in the results. It is of interest and also of importance to note that altho the resistance of the individual is considered as a single element, yet such is not the case. What we call in individual is nothing more than a most complicated aggregation of millions of cells arranged in the form of different tissues and organs. It will be found that different parts of the body will vary considerably in their power to resist infection. A comparatively small area of infection in the peritoneal cavity may mean death to the patient, yet that same person might have a quart of pus in his pleural cavity and recover. This tissue and organ immunity offers, also, one of the most interesting problems in cancer research as there are certain structures in the body that very seldom are the starting point of cancer, while others are almost always involved.

In addition to the above mentioned

modifying conditions, a third must also be taken into consideration, that is, the physical characteristics of the area involved. The results depend to a large extent upon the ability of nature to dispose of the products of inflammation, whether they can be gotten rid of easily or with difficulty. If the surrounding tissues are very dense, the cells and exudate may be retained. The battle for supremacy continues and a sort of trench warfare results, the enemy refuses to be evicted but the opposing defenses may be too strong for him to break thru.

As soon as the infection occurs an alarm is sent out from headquarters and the army of leucocytes is called upon. These cells, the white blood cells, have the property of taking up, and usually of destroying the bacteria. They are known as phagocytes and are able to perform their scavenger function on account of their ability to move in an independent manner. Altho the blood stream is their normal home, they are able to pass thru the vessel wall, particularly so in inflammation as in it the blood current becomes slower, the vessels dilate and the leucocytes are given every opportunity to escape. At the same time a larger amount of fluid passes thru the vessels and the tissues are bathed in this exudate. Studies of the blood serum have shown that it is in this fluid that the various anti-bodies are found. The result is that the phagocytes and the serum together try to destroy the bacteria and also to nullify the action of the metabolic products. While the battle is going on in the front line, the smaller blood vessels and capillaries are filling up with leucocytes which act as a barrier in preventing the extension inwards of the infection. If it were not for these protective measures every infection would be a serious affair. During this time the tissue cells are being damaged and destroyed but nature is busy in repairing the injuries that are being done. Unless the ill effects have been extremely slight the lesion recovers thru the production of granulation tissue. In this process of repair there is the formation of loops of new capillaries derived from the endothelial lining of pre-existing blood vessels. The endothelial cells become larger, the nucleus divides and two cells are formed. The cells continue to multiply until a sprout-like process extending into the surrounding tissue is formed. Adjoining buds unite, and altho at first solid, finally become hollowed out and the circulation is re-established. While this is taking place there is an increase of the fixed connective tissue cells, which surround and act as a supporting framework for the loops of new formed capillaries. In this new tissue there is at first an overproduction of cells and blood vessels, but eventually it becomes less vascular and cellular. This is brought about to a great extent by a contraction of the scar tissue.

If the infection has been sufficiently severe there may be an abscess resulting. The changes occurring are essentially those appearing in any inflammation but are greater in degree. The bacteria multiply, their products are set free to act upon and irritate the surrounding tissues. The leucocytes are poured out, and many of them go to pieces, thus setting free active enzymes or ferments which have a digestive effect upon the tissues. Finally a collection of leucocytes, fluid and broken down cells appears, and the abscess is formed. This may take several courses. In many instances, the pus following the line of least resistance, will come to the surface and the contents be discharged. This is frequently hastened by the use of the knife. The pus may not escape but be absorbed very slowly, so gradually that the body may not show any ill effects.

A third termination is that of encapsulation.

In this process nature attempts to take care of the invading organism and its products by walling them off. In other words, if this dangerous material cannot be thrown out of the body, a wall is built surrounding it, and rendering it harmless. Again comes the granulation tissue to the rescue. The old connective tissue cells take on unusual activities, new cells are formed and the entire process as already described is carried on. Finally the new structure is completed and apparently all is well. During the active reaction there will be found many minute blood vessels connecting with larger branches which in turn communicate with the general circulation. It is in this way that the products of the bacteria and the broken down tissues are absorbed, and also that fresh leucocytes and anti-bodies are brought to the seat of war. There is, of course, the danger that active bacteria may get into the system and give rise to serious general disturbances. Fortunately the infection is usually sufficiently slow in its inception to permit the resisting forces to be brought into action. Evidence shows that, as a rule, acute systemic involvement is not the general rule. As the capsule develops, the danger of the lesion becomes less, but it must be remembered that altho nature has been able to isolate this material, she has not been able to make it sterile. As long as no break occurs the bacteria cannot escape, but it may be that in the course of time some break occurs, the capsule becomes permeable and the bacteria escape. They get into the lymphatics or the blood vessels and are carried to distant parts of the body where they become lodged and possibly start an inflammation.

The above is the history of the formation of a "focal infection." It is to all intents and purposes nothing more than a small abscess that has been encapsulated to a varying degree. Such lesions may be found in various parts of the body, but it would seem that the most common site is around the apices of the teeth. From what has been said it can be seen that the danger from such an area is comparatively slight as long as it remains isolated. In tuberculosis, the most that can as a rule be hoped for is a walling off of the diseased area. This not infrequently occurs but the usual fatal termination shows that the capsule formation has not been able to hold the process in abeyance. Consequently the danger of "focal infections" frequently lies in what may result, as well as in what already has happened.

The particular focal infections that interest us at present are those which are found about the roots of teeth. In regard to their causation it is held by some that the infection may result from the carrying of bacteria by the blood from some more distant part of the body to the tissues about the teeth. That this might occur cannot be denied but the preponderence of evidence is that the infection originates in the tissues in or about the teeth. In those cases in which extensive cavity formation has taken place so that the pulp has been exposed, it is very easy to realize how readily the inflammation can extend. It is not necessary that the canal be completely exposed as after about one-half of the dentin has been destroyed, the larger part of the dentinal tubules are open and there is little to interfere with the passage of the bacteria. There are, however, many instances where apparently there is no lesion in the tooth to account for the infection. It would seem that the anatomical arrangement of the tooth and its surrounding structures might give the clue. From the apical vein are given off branches which extend along the peridental membrane close to the gum margin. As pathogenic organisms are

constantly present in the mouth it would not be difficult for them to penetrate the veins and give rise to partial thrombosis. Judging from such lesions elsewhere in the body this thrombosis or coagulation of the blood will continue to extend along the vessel and can easily cause inflammation in the surrounding tissue. In many teeth there are multiple foramina to be found at different levels. In cases of pyorrhea where a large part of the tooth is exposed as a result of absorption of the interdental portions of the alveolar process there would be little difficulty for the bacteria to gain entrance. In fact, there seems to be little difficulty in explaining how the infecting agents may gain entrance.

After the bacteria have once gained entrance, what are the changes that take place? Primarily there is no difference from the inflammations that occur elsewhere altho the symptoms will be modified on account of the peculiarities of the structures involved. If one could but watch the process he would see the changes in the circulation, the escape of exudate and of cells, and the destruction of tissue with the formation of pus. There are, however, certain peculiarities that cause a true alveolar abscess to differ from an abscess elsewhere. The peridental membrane is the vascular structure involved primarily and as a result of its inflammation there is very quickly an effect exerted upon the neighboring bone. This tissue appears to have very little resistance, it breaks down and becomes absorbed, leaving a definite cavity containing purulent material. This process may continue and finally make an exit in any one of many directions, or it may remain distinctly localized. In order that it may be rendered harmless, we find that the cells of the peridental membrane will undergo multiplication with the formation of connective tissue. This will continue until in time a distinct capsule will form. It is interesting to note that the examination of the alveolar process around such areas will at times show a distinct condensation of the bone that is in immediate contact with the inflammatory portion. This in turn gives an extra barrier to the extension of the process. As long as the protective formations maintain their integrity no trouble results, but it may be that a break occurs somewhere. In such a happening the bacteria may enter the lymphatics and eventually make their way into the circulation. In this way they may be carried to distant parts of the body where they become lodged and set up inflammations of varying severity.

A study of the various textbooks of medicine will show that many of the aches and ills of the human body are attributed to the escape of infectious material from such foci. The locality at present considered particularly guilty is that about the apices of the teeth, but the tonsils are held responsible in many instances. As the organisms gain entrance into the blood they must be carried to all parts of the body. Consequently it would seem that one tissue or organ would be as liable to infection as any other, yet such is not the case. It will be noted that all parts of the body do not seem equally susceptible to injury. The reason for this is difficult to determine. It may be due to some inherent protective power possessed by the tissue or it may be a matter of mechanical arrangement. It is a well recognized fact that endocarditis is a not uncommon result of infections in distant parts of the body. It will be found that not the endocardium in general will be involved but usually only that portion which forms the valves. To carry it a little further, our investigations will show that the inflammation practically always starts in a very restricted area on the valve. This is not due to anything peculiar in the formation of the endocardium at this point. The infection is

not carried there by capillary blood vessels as there are none that far out on the valve. The explanation is a mechanical one. When the valves come together to prevent the back-flow of the blood they meet along what is known as the line of closure. Many experiments have shown that the bacteria will lodge here and set up a more or less severe lesion.

Altho acute cardiac inflammation may occur, the greatest number of secondary lesions will probably be found in connection with the joints. These will not rank as possibly fatal complications but there is little doubt that there is hardly any one other condition which causes so much long-continued suffering and semi-invalidism. From the layman's viewpoint and from that of the ordinary medical practitioner, these conditions are all grouped as rheumatism. A little asperin and considerable neglect has in the past been the portion of such patients. Today the prevention and even the cure of many will rest entirely upon the knowledge of their dentist. He will see many of the cases and will be called upon to give his opinion as to the proper handling of the case. In those cases of true acute rheumatism accompanied by fever and inflamed joints with all the cardinal symptoms present there is no doubt as to the infectious origin. The organisms have gained entrance to the blood and have overwhelmed the body, the origin being in some tonsillar or alveolar infection. It is, however, the chronic type of joint lesion, the so-called arthritis deformans, that gives the greatest amount of trouble to the practitioner. In these cases there is a long history of a slowly progressing disease, frequently accompanied by great pain and eventually making the patient a helpless invalid. That such cases may result from chronic alveolar abscesses seems well established. About the best evidence being the wonderful improvement in the patient's condition that frequently follows the removal of the infected teeth. As to why the joints should be a favorite site of infection there is very little to be said. The organisms pass thru the circulation, reach the tissues surrounding the joints, particularly the synovial membrane, and start up a periarticular inflammation. The capillary blood supply to these membranes is particularly rich and that may be one factor.

In that form of arthritis which appears in younger people, there is a general involvement of many joints, the attack beginning very much like a true infectious rheumatism. In such patients there has probably been an overwhelming number of bacteria thrown out into the circulation with practically a generalized infection following.

In the more common form as found in older people the joints usually affected are those of the hands and feet and the inflammatory symptoms are negligible. It may well be that these localities are very prone to injuries of all kinds and consequently have lost a large part of the resistance that is possessed by the younger individuals. The result being that as bacteria escape in small numbers from the focal infections they are carried to the tissues of the body, locate in those which are below normal and give rise to chronic degenerative changes.

In connection with the secondary lesions an interesting point has been made by various observers, Rosenow in particular, concerning an apparently selective power exerted by the bacteria. According to these men, an organism that has invaded a tissue and caused an inflammatory lesion acquires a selective affinity for that special part. If, for instance, a streptococcus that has been isolated from a gall bladder abscess is injected into an experimental animal, it will locate in many instances in the gall bladder. None of the investigators claim

that this will occur in every case or even in a majority, but that it will happen so often as to be extremely suggestive. If the streptococci obtained from an apical abscess found in man are introduced into a rabbit the dental pulp will frequently show involvement. This selective action has been observed so frequently that it seems quite well established that an organism, after having grown in a special locality, will show a marked predeliction for that tissue. This property of adaptability on the part of the bacteria can be demonstrated quite readily in the laboratory. A culture media may be used that is not well adapted for the purpose and one in which the bacteria are slow in developing. In the course of time they appear to become acclimated, and when transferred to other tubes of the same media will grow very satisfactorily. If this can occur in such artificial conditions there appears to be no reason for believing that similar possibilities should not exist as far as the living tissues are concerned. We know that by passing an organism thru a series of animals that its virulence for that particular species is increased, but not its virulence for some other type of animal.

This specificity, therefore, is a matter of development and acquirement on the part of the organism, it is not something inherent. For this reason it should not be taken for granted that a streptococcus growing in an alveolar abscess will necessarily have any affinity for the synovial membranes of the joints or for the heart. In fact, laboratory experiments would tend to prove the contrary. When pure cultures of streptococcus viridans obtained from tooth abscesses and cases of pyorrhea are injected into animals, there have been no tissues other than those of the heart that have shown any special involvement. The joints have been affected but so have the stomach and the thymus gland in equal percentage. The appendix, kidney and intestines show a frequency twice as great. The fact that the endocardium and the myocardium are attacked three times as often as the joints is not a question of affinity. It can be explained on anatomical grounds. The organisms are in the blood, and as already explained have an ususual opportunity to act upon the valves. In regard to the myocardium, the capillaries of the heart muscle are end vessels with practically no anastomoses so the bacteria become lodged and cause trouble.

Altho the heart and joint lesions are the most common, and therefore the most important, there are numerous other conditions in which focal infections are concerned. Iritis in quite a large number of instances can be shown to be due to localized abscesses about the teeth as the attack has cleared up when the diseased tooth was removed. In fact so many diseases have been said to be due to focal infections that the great danger today seems to be that of over-emphasizing their importance. There is a tendency among medical men to send their patients to a roentgenologist to have a dental film made. If this shows an area of decreased resistance about the root of a tooth the diagnosis is made and the patient referred to a dentist to have that tooth extracted. In passing it may be well to once more emphasize the necessity of having a skilled man make the interpretations from the films. Too many men who call themselves roentgenologists are only good technicians. It may be that the tooth lesion has nothing to do with the general condition. It is on the same principle as making a diagnosis of syphilis of the tongue because the patient has a positive Wasserman. The growth may be a cancer and before its true nature is discovered it is too late to do anything.

So far there has been under discussion

the pathological changes that take place in the formation of focal infections and the proof that they can cause general systemic conditions. An important part of the question is that dealing with the causative agent. The first thing to show is that the organisms present in the local area of disturbance are the ones that have caused the secondary lesions. In certain instances this is very easily done. For example, a case of acute urethritis is under treatment and within a short time certain of the joints become acutely inflamed. Examination of the urethral pus shows gonococci and in the exudate of the joint similar bacteria are found. A single case of that kind would go far in proving the argument, and when such results have been obtained in hundreds of cases the possibility of error becomes less and less. It may be that an examination of the lesions in the heart show pneumococci and the patient died of pneumonia. There is no room for doubting that we are dealing with cause and effect.

Many other organisms have been found in the secondarily attacked tissues. B. typhosus, B. coli, B. influenza, the staphylococcus, and last but by no means the least is the streptococcus. During the past few years the streptococci have occupied about the most prominent position in the field of bacteriology and clinical medicine. Comparatively little attention has been given it in the past but it is now one of the chief topics of interest. As was the case with other bacteria most investigators considered that every organism of one class was similar to every other. As laboratory methods became more exact it was found that such was not the case. For instance, it has been shown that the meningococci are by no means of one type, but the clearest example of all is probably the pneumococcus. Instead of there being but one kind there are four distinct groups and what is of particular value is the fact that the severity of the infection depends upon which variety is causing the trouble. If it be of Type I, the chances of recovery are fairly good, about equal. If on the other hand the infection is by the more uncommon, Type III, the chances of recovery are very slight.

These same things hold good in regard to the streptococci but the subject seems rather complicated. At first it was supposed that there was but one group, that the results depended upon the virulence of that particular organism and the resistance of the patient. Further studies have shown that the question is by no means the simple one that it was thought to be. By the use of various media it was found that there were constant variations in the growth and one of the first divisions made of streptococci was into the hemolytic and the non-hemolytic. By cultivating these organisms upon media containing blood cells it was noted that certain colonies would form a clear zone about them. The hemoglobin was not only broken down but the color was completely destroyed. It seems also that there is a definite relation existing between the width of the zone and the virulence of the organism. On the other hand some colonies of streptococci were found to have no hemolytic action on the blood cells, but did produce a greenish discoloration due to the reduction of the hemoglobin into methemoglobin.

More recent work, in which agglutination reactions were used as the basis for classification, would indicate that there are three main groups of the hemolytic streptococci. Out of 292 different strains, 93% of them were included within these three classes. The remaining 7% was made up of members possessing different biologic characteristics.

The non-hemolytic group probably

consists of many variaties of streptococci, but the one most commonly associated with apical abscesses is S. viridans or mitior. In a study of the bacteriology of 130 such abscesses, streptococci were found in 124, and with a few exceptions were of the viridans type. From the point of view of virulence this variety does not seem to be as active as the hemolytic. It, however, is found in the same localities and, without doubt, is able to cause serious conditions. The lesions caused by it seem to be of a less acute form, the acute inflammation is not so common. Microscopic examination of the tissues attacked bears out the clinical observations. If the foci in the heart muscle are examined it will be found that they show the presence of lymphocytes, fibroblasts and a few giant cells. In the older areas distinct fibrous scars may be found. When the infection is due to hemolytic streptococci the lesions are minute abscesses filled with pus and surrounded by an area of leucocytic infiltration.

The general practitioner, however, is not so much concerned with the variety of organism present as he is with the fact that focal inflammations are commonly caused by the S. viridans and that this same organism can give rise to systemic infections. Of this there can be no doubt as the observations of many men in many parts of the world have confirmed the results. The bacteria have been found in the focal infections, similar organisms have been found in the secondary areas, and animal inoculations have reproduced the lesions. There is no proof lacking that we are dealing with cause and effect. Therefore every practitioner who makes the diagnosis of an apical abscess must remember that he is dealing with a condition that has the potential power of causing very serious trouble. In many instances there will be no ill effects, but the possibilities must always be considered.

"COME-CLEAN."

By Major Leonard G. Mitchell, D. C., U. S. A.

Read by Major Eby.

(Read before the National Dental Association at Its Twenty-third Annual Session, New Orleans, La., October 20-24, 1919.)

THE three-reel motion picture we are about to see, was made at the Army Medical Museum, for the purpose of teaching our soldiers the importance of freeing the mouth of all infection and maintaining mouth hygiene. This picture was made by direction of, and endorsed by, the Surgeon-General of the army.

In order that the scientific part of this picture might be above criticism, we secured the services of Colonel Frank Billings to assist in that part wherein we trace infection from the mouth to various parts of the body. The scenario is based upon that written by Doctor A. C. Fones. The only experienced man appearing on the screen is Mr. Nate Watts, who takes the part of Tom Merrill.

It was not possible for the Museum to

begin making this picture until after the Armistice was signed, therefore it was made under difficulties. The first official showing was viewed by the Surgeon-General and about twenty heads of Departments. The film was then three and one-half reels. It has since been cut to a little less than three reels. Thirty copies of this picture have been allowed. The Division of Educational Extension, Visual Instruction Section of the Department of the Interior, will distribute twenty-three copies in as many states. This department contemplates making more copies in the near future so they may cover the entire United States. One copy has been assigned to the United States Public Health Service and is being used by Major Butler of that department. The remaining copies are being distributed by the Army Medical Museum to Army Camps and Posts. Copies will also be supplied, upon application, to other organizations in civil life. A lecture, duly approved by the Surgeon-General's office, will accompany each copy, to be read or used as an outline for a lecture.

This degree of recognition of the importance of dentistry by the army, the department of the Interior and the United States Public Health Service, together with the wonderful impetus which the war has given to dentistry thruout the country, easily marks this period as epochal. In a comparatively short time, the demand for dental service in this country will greatly exceed the supply. This period may also be regarded as epochal from another standpoint,—for while the Nation is being taught the importance of month hygiene and dental service, it is also learning some of the causes of mouth infection and its influence upon the body,—causes which are not always complimentary to our profession.

This war has given many dental officers an unusual opportunity for a close-up view of dental work from all sections of the country, not only seeing the work in the mouths of thousands of soldiers, but also many thousands of X-ray pictures. Early in the war we began using the X-ray extensively. Modern X-ray equipment was installed in every hospital and camp, and a routine practice established of X-raying all suspicious cases.

Because of the seriousness of the situation, may we briefly note the conditions in a general way: The dental officers, whose duties required them to examine the mouths of all recruits, declare the per cent of dental work which produces pathological conditions is appalling. The roentgenologists who have done dental radiography go still further—a number of them state it is a rare occurrence to find a root-canal reasonably well filled.

It seems unfortunate that we are so isolated in our work, compared with the surgeon. With the surgeon, there is a constant check-up on his work. His environment, with other scientifically-trained men and nurses interested, practically insures skillful and aseptic operative procedure. No such atmosphere surrounds the dentist,—there is no probability of a check-up on his operations. However, it is most gratifying to note the marked increase in the number of modern crowns and bridges wherein the dental pulp has not been sacrificed and where more sanitary conditions are possible. It is most encouraging for this branch of constructive dentistry. If we can but bring up the other sectors to this front-line trench, we will be ready to go over the top!

Is not this epochal period in dental history a most favorable time to start a drive thruout the country for general improvement in the common every-day

operations,—the operations every dentist knows how to do and is called upon to do every day? This drive should be conducted thru "channels,"—society meetings and journals. The results would surely justify the means, even tho it necessitated a temporary discontinuance of attention to new things.

The United States government is now, as you know, in the midst of a nation-wide campaign of education along lines which have for their aim and purpose a more virile and stronger people. The dental profession is and will be a most potent factor in this great campaign which surpasses any like effort in the history of the country. Doctor Ales Hrdlicka, Curator of the division of Physical Anthropology, United States National Museum, who has probably dug up more skeletons of prehistoric races in various parts of the world than any other man, and who has made a most exhaustive study of bone formation and evolution of jaws, makes the statement that dentistry is destined to take first place among the healing arts.

May we realize the importance of our part in this great campaign,—that the relation of mouth infection to disease of the body is one of the most serious problems confronting dentistry and American people today. May the leading men of dentistry temporarily leave the beaten path of inclination and new discoveries for this more urgent need,—the crisis in our profession—and direct their large influence toward raising thruout the profession the standard of these common, every-day operations.

Thus may we render to society the service it has the right to expect, and fulfill our obligation to our countrymen.

The moving picture film illustrative of the paper of Dr. Mitchell, was here shown upon the screen, following which the following proceedings were had.

Burton Lee Thorpe, St. Louis, Mo.

I think you will all agree with me that this is a very beautiful film, not only for educating the layman, but also the dentist. This film ought to be shown forever and ever before all sorts of audiences on all occasions possible, and I move you, Mr. Chairman, that we, of this section, recognize the value of the film and our most hearty thanks to Major Eby for his kindness in showing this film, also by sending a telegram to Major Mitchell, our friend for many years in this section who has worked with us and contributed to this cause on many occasions, expressing our most hearty congratulations and thanks for the film, and our best wishes for his early recovery.

The motion was duly seconded and carried unanimously.

TEACHING OPERATIVE DENTISTRY.

By H. E. Friesell, B.S., D.D.S., Pittsburg.

(Read before the American Institute of Dental Teachers, Detroit, Mich., Jan. 27-29, 1920.)

AS ONE of the debaters for the affirmative I am perfectly willing and, in fact, feel a great desire to rest the case with the excellent presentation made by Dr. Thornton. I also wish to assure you that I am here simply because two men whom I have heretofore looked upon as gentlemen and friends, waylaid me in the hall and did not permit me to volunteer or do anything else but to be drafted. I can assure you also that I regret exceedingly the illness which prevented Dr. Thomas from coming to this meeting.

In the School of Dentistry at Pittsburgh the course in operative dentistry is being taught to sophomore students. The methods used consist of a certain number of hours each week spent in laboratory practice, demonstrating upon inanimate objects,—upon tooth forms of one kind or another, the principles which we are trying to teach in this course. The work is amplified by quizzes at frequent and irregular intervals, and includes a didactic course in the form of lectures which are given and arranged for the purpose of explaining to the student how to study the various phases of the subject as they are presented or as they arise in the laboratory. An effort is made to coordinate the laboratory work, the collateral reading and the didactic work.

At the beginning of the course the meaning of the subject "Operative Dentistry," is explained to the class. The content of the course itself is also gone over in some detail in order that the student may know just what he is starting to study in that particular; whether he is preparing himself for a one-hundred-yard race or a Marathon; the relation of this particular course to other courses where the teaching must necessarily overlap; the manner in which the subject matter will be presented and also the reasons for such methods of presentation. All of these things are explained in lectures to the class so that the students may have some general conception of the work that they are to take up in this particular course, because we believe the student should have some idea of where he is going and why he is going there and the length of time that it will take him to reach his destination as well as the main points of interest on the way. As prerequisites for this subject we have dental anatomy and dental histology and also the subjects upon which those are based.

In the laboratory the student has been provided with extracted teeth and he studies the decayed areas on those extracted teeth. He compares one with another and notes the variations in the action of decay upon different teeth and upon different surfaces of the same teeth. He makes sections thru these carious areas and studies the progress of decay in the enamel and in the dentin and the manner in which it encroaches upon the pulp cavity of the tooth. He also is provided with large plaster models of the teeth upon which he outlines

the various tissues, their limits and their relation to each other, and upon which he indicates the essential points that it is necessary for us to know, such as the gingival line and the gum line, the gum margin, the height of contour, the contact point, the axial angles, the fissures, and other things of that character.

In the course already covered up to this time, he has studied the classification of teeth themselves, the relation of one tooth to another, the relationship of teeth in one jaw to others in the same jaw and to the teeth in the opposite jaw. He has also studied, rather briefly, dental caries, not in such detail as he will in the course in dental pathology, but to a sufficient degree to enable him to understand certain things in regard to this work which he must understand for the purely operative procedures. He has learned what caries is, its clinical manifestations, where it begins, how it progresses, why it spreads on some surfaces and why it does not spread on others, and, when its spread ceases, the reason for that cessation. And in this particular lecture we come to cavity classification, such classification being based upon the preceding preparation. We start in with an explanation of why it is desirable to classify cavities, and explain, where opportunity offers, the importance of classifying knowledge of any kind in order that one may be taught closer observation, a regular order of arrangement of ideas and concepts so that they may be of use to the individual. We impress upon him the fact that science itself is simply an orderly arrangement of demonstrated facts in regard to something that is placed upon a scientific basis. We try to teach him how to observe, and how to collect the factors that he does observe in connection with cavities of decay, to arrange these in some order and to classify the cavities according to the similarities that he is able to discover and to point out upon the extracted teeth. In this way we endeavor to establish firmly in his mind a recognition of the underlying principles of this particular subject. We have thirty-two teeth in the permanent denture, and each one of these teeth may have cavities present upon five surfaces, which will give us the possibility of at least 160 cavities. If in connection with consideration of cavities of decay, the student is permitted to approach the subject of the operation of filling these cavities simply as the process of stopping up various sized holes that happen, some way or other, in teeth, we cannot develop the type of dentist that is necessary today. So we teach him that these cavities are simply an evidence,—one of the symptoms, one of the pronounced symptoms, of what we recognize as a disease, and that the cavity itself and the size of the cavity have no important bearing upon the principles involved. But the fact that a lesion has occurred in a definite surface on a particular tooth is the indication that this patient is suffering from the disease, dental caries, and that in his treatment of the case as a dentist he must take into consideration the fact that he is treating the disease, dental caries, and that these cavities, as they present at this time, are simply the evidence of a certain stage of development of the disease in the mouth of that particular patient.

Now, there are a great many factors to be taken into consideration, and unless we arrange these factors in an orderly manner so that the student may have some definite idea as to what he must try to do, the end that he desires to attain and the best method for attaining it, we are not going to obtain the best results. We try then to show him that it is not simply a case of indis-

criminate cavities here and there in the mouth, but that the disease itself can be very well studied and very largely controlled if he will first understand and then classify all of these factors, and that if he does so and arranges in groups the conditions or factors that he finds to be similar (as he will in many ways), he can then arrange all cavities in five, or at the most, six classes.

Then we try to demonstrate to the students the factors that obtain in each one of these classes—how decay begins in each one, how it progresses, what limits its progress, and the operative procedures that are logically necessary to repair the lesions and to leave that surface of the tooth in such condition that it will no longer be subject to dental caries. And then we go into the general principles of that classification.

I do not know that it is necessary or desirable for me to go over that classification here, because the dental men are familiar with those factors and the teachers who are to discuss the presentation of our methods of teaching would probably have no more evidence afforded by a reference to these details than they have already doubtless gained from the attempt to present the principles. I will merely add that at the beginning of this lecture a brief quiz of perhaps ten minutes would precede the lecture subject for the purpose of refreshing the student's mind in regard to the matters that have immediately preceded this in the course, because, since the class last assembled for this work, the students have met many other teachers and their attention has been devoted to the study of several other subjects. So at times a brief review is presented, sometimes reference is made to the salient points of the previous lecture or of the work up to this time, stressing those factors that are to stand out as most important in the present lecture or recitation or whatever form the work of the hour happens to take. A brief quiz of eight or ten minutes is sometimes conducted with the view of eliciting this information from the students themselves. It is usually the object of the lecturer to conclude the didactic portion of his lecture perhaps five or six minutes before the end of the period and then to review again briefly, and to emphasize the main points that he has tried to bring out in the lecture itself.

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VOL. 7 SEPTEMBER, 1920 No. 9

Editorial Department.

THE BOSTON SESSION.

The National Dental Association's twenty-fourth annual session, which was the Sixty-second anniversary of organized dentistry, held in Boston, August 23-27, 1920, is now a matter of history. More and more it is becoming evident that this was a great meeting. The character of this session may well be judged by the universal expression of opinion—"the best meeting I ever attended." This encomium was heard from men who are qualified to judge of the real merits of a meeting.

No medical or dental convention has ever received such excellent publicity work from the newspapers. The dental profession appreciates keenly the thoroness with which every phase of the meeting was covered by the great Boston dailies. *The Boston Evening Transcript* of Monday, August 23, gave a two-column report from which we take the following quotation:

> "It required the whole day to give shape to the convention, owing to the large number of delegates and visitors. The usual arrangements had been made in the corridor for the registration, and after the people had qualified at the registration desks they faced the jam inside the hall that such large conventions necessarily impose, and the novel device invented to guide them to the special places that they might seek in the building. So large was the crowd that a policeman was stationed at the inner entrance to keep the traffic moving in an orderly way. Once inside, the visitor saw a maze of exhibits, probably all the varieties of instruments and preparations known to the profession, all displayed in a profusion of light and colors.
>
> "All, moved by the same impulse, lifted their eyes as soon as they stepped into the hall, for hanging from the ceiling was to be found the true guide, sufficient for all except the color blind. Each visitor found his instructions in the printed program that he should follow the ribbon of some specific color to the particular hall assigned for his special branch of dentistry. These ribbons were fastened over the door to large signs bearing the names of the sections and then spun out over the hall. The black and yellow ribbons turned immediately to the right and went up over the stairs to the Paul Revere Banquet Hall and the reception room, where the Prosthetic Dentistry and Crown and Bridge sections were to meet. Red, green, lilac, blue and pink ribbons ran straight ahead over the main aisle to the first door on the left, passing out thru which they twined together like a cable over the stairs on that side, at the top of which they separated again, one turning to the right, another going straight ahead, another bearing slightly to the left and two turning sharply to the left, each leading to some meeting place."

The following is a brief summary of the outstanding features of this great meeting:

1. The largest registration in the history of a dental meeting—6,612.

2. Present membership of the National Dental Association—27,000.

3. The Secretary's and Treasurer's financial reports show that the National Dental Association has increased its total assets from practically zero in 1913 to nearly three hundred thousand dollars ($300,000).

4. National Relief Fund endowment increased to one hundred

thousand dollars ($100,000) before distribution is to be made of any funds. Present amount in the fund, $52,147.66.

5. The creating of an endowment fund of five hundred thousand dollars ($500,000) during the next five years for *The Journal of the National Dental Association.* This fund to be increased to one million dollars ($1,000,000) in the next seven years. The present amount in this fund in cash is $42,828.87. The accountant's value on present assets in Journal is one hundred and fifty thousand dollars ($150,000.00.)

6. "The Research Institute of the National Dental Association to be sold or leased, its debts and obligations paid and the balance, if sold, suitably invested and only the income used for research, to be expended as grants by the Research Commission of the National Dental Association." This will, in no way, affect the contributions being made by state societies for research work as the Research Commission will continue to conduct researches by extending grants.

7. The changing of the Constitution and By-laws to provide for a standing committee on Mouth Hygiene and Public Instruction. The reports of standing committees noted progress.

8. Sir Kenneth Goadby, of London, England, was unanimously elected an honorary member of the National Dental Association.

9. A resolution that whisky and brandy be restored to the United States Pharmacopoei was voted down by the House of Delegates.

10. The next annual session of the National Dental Association will be held in Milwaukee in August, 1921.

11. The Boston meeting established a new epoch in program building—presenting a practical demonstration of a real SEMINAR COURSE. The program for this SEMINAR COURSE was instructive. It was arranged so that the essayists and clinicians could demonstrate their theses. This was the first attempt of the National to conduct both a literary and clinical program as seven complete dental societies each confined to a definite branch of dentistry. Every program committee in local and state society work might study with profit the plans inaugurated and successfully carried out by the National in the Boston meeting.

12. The House of Delegates elected the following officers: President, H. E. Friesell, Pittsburgh, Pa.; President-elect, Thomas B. Hartzell, Minneapolis, Minn.; Vice Presidents, Robert T. Oliver, Washington, D. C., F. R. Henshaw, Indianapolis, Ind., Samuel H. McAfee, New Orleans, La.; General Secretary, Otto U. King, Chicago, Ill.;

Treasurer, Arthur R. Melendy, Knoxville, Tenn; Board of Trustees, Harvey J. Burkhart, '23, Rochester, N. Y.; Thomas P. Hinman, '23, Atlanta, Ga.; C. W. Hall, '23, Milwaukee, Wis.

Silver Anniversary Session, Milwaukee, 1921.

While everyone is praising the fine record of the Boston meeting, the officers elected for the coming year must realize that the accomplishment of this great meeting must be excelled in the 1921 session, if the dental profession is to participate in the achievements of this progressive age.

The success of this year's meeting should kindle in the breast of everyone who has anything to do with next year's meeting an ambitious desire to courageously discharge the tremendous responsibility they have inherited for the advancement of the cause of dentistry.

The plans for the 1921 meeting should be outlined immediately. Nothing should be left to the eleventh hour. The arrangements must be so visualized that every officer and member of the National will immediately turn his face toward Milwaukee, knowing for a certainty that the "Silver Anniversary Session" of the National Dental Association will mark a distinct advancement in dental history.

MOVEMENT FOR WORLD HEALTH.

One of the direct results of modern Internationalism and League of Nations protocols has been the formation recently of an International Health Office, with which office Internationale d'Hygene Publique has been consolidated.

This is an opportune step. While some diseases are local, the great destroyers are world-wide in their effects. National boundaries do not deter such diseases. These can only be successfully combated by international action.

The International Health Office will not proceed very far with its work of combating world-wide disease until it discovers, if it has not already done so, the intimate relation of drink to the world's diseases—its degenerative effect on embryonic life, its weakening the somatic defenses against bacterial invasion, its causing functional disturbances of various kinds, its interference with elimination of cell waste, its robbing the tissues of oxygen necessary for the carrying on of the vital processes and the like. The International Health Office will find itself compelled as conservator of the public health to take up the gauge of battle against alcoholic beverages as the American Boards of Health have been compelled to do. The health of the world will be immeasurably better and its people happier when alcoholic beverages are nothing but an unpleasant memory.—*The American Issue, August 14, 1920.*

STATE SOCIETIES.

November.

18—District of Columbia, George Washington University, Washington, D. C.
30—Dec. 1-2, Ohio, Columbus.
Arizona, Phoenix.

December.

10—Delaware, Wilmington.

MICHIGAN STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Michigan Dental Board for examinations will be held at the Dental College, Ann Arbor, Michigan, November 8 to 13, 1920. Those desiring further particulars may write to B. S. Sutherland, Sec.-Treas., Owosso, Mich.

MISSOURI DENTAL BOARD.

The next meeting of the Missouri Dental Board for examining applicants will be held in Jefferson City, beginning Monday, October 11, at 8 A. M.

V. R. McCUE, Sec'y,
Cameron, Mo.

OKLAHOMA STATE BOARD MEETING.

Next examination December 27, 1920, Senate Chamber State Capitol Bldg., Oklahoma City, L. M. Doss, Secretary-Treasurer, 245 American National Bank Bldg. No reciprocity, no temporary license.

MARYLAND BOARD OF DENTAL EXAMINERS.

The Maryland Board of Dental Examiners will meet for examination of candidates for certificates on November 10, 11 and 12, in Baltimore at the Baltimore College of Dental Surgery at 9 A. M.

For application blanks and further information apply to

F. F. DREW, Secretary,
No. 701 N. Howard St., Baltimore, Md.

SUSQUEHANNA DENTAL ASSOCIATION.

The fifty-seventh annual meeting of the Susquehanna Dental Association will be held at Hotel Sterling, Wilkes-Barre, Pennsylvania, October 26, 27 and 28, 1920.

FULLER L. DAVENPORT, Chairman,
520 Miners Bank Bldg.,
Wilkes-Barre, Pa.

RHODE ISLAND BOARD OF REGISTRATION IN DENTISTRY.

The regular semi-annual meeting of the Rhode Island Board of Registration in Dentistry for the examination of candidates will be held in the State House, Providence, R. I., October 19 and 20, 1920.

All applications with the proper fee must be filed one week previous. For further information address

ERNEST A. CHARBONNEL, Sec'y.,
334 Westminster St., Providence, R. I.

DISCONTINUANCE OF THE GEORGE WASHINGTON UNIVERSITY DENTAL SCHOOL.

At a meeting of the Board of Trustees of this University, it was decided to temporarily discontinue our Dental School.

This action was brought about by the fact that it became imperative to completely separate medical from dental teaching (both schools occupying the same laboratories at the present time) Coupled with this was the impossibility of finding a suitable, separate building for the Dental School and the further fact that sufficient funds were not available to maintain the school in a creditable manner.

It was therefore decided to discontinue the Dental School at the close of the present academic year, until by virtue of a successful drive for an endowment for the University or by gifts or grants from other sources, sufficient funds are obtained to maintain an acceptable dental school.

CARL J. MESS, D. D. S., Dean.

DENTAL CORPS ORDERS FROM WAR DEPARTMENT.

DENTAL CORPS.

First Lieut. Chester B. Parkinson from duty at Fort Miley, Calif., to San Francisco and to Panama Canal Department for duty.

—*Army and Navy Register, August 7.*

Maj. John W. Scovel from station at Fort McHenry, Md., to San Francisco, Letterman General Hospital, for duty.

Maj. Samuel W. Hussey, Capt. Frank L. Cooper honorably discharged.

Maj. Lee B. Schrader from duty Camp Gordon, Ga., to Fort Sill, Okla., for duty.

Capt. Lynn H. Tingay from duties at Camp Gordon, Ga., to Fort Monroe, Va., for duty.

Capt. George R. Ellis from duties in Washington to Camp Gordon, Ga., for duty.

The promotion of the following to captain in dental corps, Regular Army, from August 5, 1920, is announced: First Lieuts. James B. Mann, Herbert E. Guthrie.

First Lieut. James J. Weeks from duty at Fort Sheridan, Ill., to attend surgeon's office, Washington, for duty.

First Lieut. Harry Holmes transferred from Lawson General Hospital, Atlanta, Ga., to Walter Reed General Hospital, D. C., for observation and treatment.

—*Army and Navy Register, August 14.*

Lieut. Col. Robert F. Patterson, at Camp Gordon, Ga., report to 5th Division for duty as division dental surgeon.

Maj. Eugene Milburn from duties at Fort Monroe, Va., to Camp Gordon, Ga., for duty.

Maj. Charles C. Mann from duties at Columbus Barracks, Ohio, to Fort D. A. Russell, Wyo., for duty, relieving Capt. William B. Stewart, who will proceed to Fort Leavenworth, Kans., for duty.

Maj. Frederick R. Wunderlich from duty at Camp Zachary Taylor, Ky., to Camp Funston, Kans., 7th Division for duty as division dental surgeon.

Capt. Milton A. Price from duty at McCook Field, Dayton, Ohio, to Fairfield, Ohio, Wilbur Wright air service depot for duty.

Capt. Roger L. Dill, First Lieut. Leigh J. Woodworth, honorably discharged.

First Lieut. Page P. A. Chesser from duties at Walter Reed General Hospital, D. C., to Camp Benning, Ga., for duty.

—*Army and Navy Register, August 21.*

Capt. Neal Ross at Fitzsimons General Hospital, Denver, Colo., is transferred to station hospital, Fort Sam Houston, Tex., for observation and treatment.

Promotion of the following to grade of captain in dental corps, Regular Army, announced.

To be captains—First Lieuts. Howard C. Feyler, June 5, 1920; James H. O'Reilly, July 12, 1920; Joseph H. Jaffer, August 17, 1920.

First Lieut. Kenneth M. Kern honorably discharged.

—*Army and Navy Register, August 28.*

Maj. Richard F. Doran, honorably discharged as major, dental corps, in emergency forces, to accept temporary commission as emergency officer in lower grade; appointed captain, dental corps, temporarily, in emergency forces.

First Lieut. Harry T. Ostrum from duty at Fort Logan, Colo., to Camp Pike, Ark., for duty.

First Lieut. Egbert W. Van D. Cowan from duty at Camp Taylor, Ky., to Camp Gordon, Ga., for duty.

First Lieuts. Edward Barbour, Fred M. York honorably discharged.

—*Army and Navy Register, September 4.*

In Memoriam

ALBERT HENRY STEVENSON.
1884-1920.

By F. T. Van Woert, New York City.

Dr. Albert Henry Stevenson was born in Brooklyn on March 22, 1884. He received his early education in the public schools of Brooklyn. He was graduated from the New York College of Dentistry in 1906, and was in active practice up to the time of his death.

In 1907 he joined the Second District Dental Society, and immediately became interested and active in public health education, particularly oral hygiene. He became a member of the Oral Hygiene Committee the same year, and the following year he was made Chairman of the Oral Hygiene Committee. During his term as Chairman of this Committee he devised and organized a method of tooth-brushing, known as the "Tooth-Brush Drill," which was published in the Dental Items of Interest and widely copied throughout the country. He was also active in establishing the Schermerhorn Dental Clinic for the school children of Brooklyn. He then became a member of the State Committee on Oral Hygiene for the State of New York.

From 1910 to 1911 he was a member of the Committee on Public Health and Education of the Second District Dental Society and was Chairman of same from 1912 to 1913. In 1914 he was elected president of this society.

Dr. Stevenson was a member of the Second District Dental Society; the New York State Dental Society; the National Dental Association; the New York Dental Research Club; and honorary member of several other scientific bodies. He was a delegate to the House of Delegates of the National Dental Association, 1919-1920.

In May, 1917, Dr. Stevenson joined Troop A of the Home Defense League, as a private. He was made lieutenant soon after and finally captain of the troop. His energetic work and popularity with the men soon made this troop so efficient as to receive the praise from the police department of which it had become an active part, known as the Police Reserve.

In July, 1918, he was made assistant to the Director of Extension Teaching in charge of the Courses in Oral Hygiene, Columbia University. The following January he was put in charge of the Advanced Courses in Dentistry of Columbia University—the post-graduate department. He was appointed assistant professor of preventive dentistry in July, 1919, and was advanced to a full professorship in July of this year.

Dr. Stevenson gave much of his time

to lecturing in the public schools, mothers' clubs and settlement houses. He was very active in the public health work of the New York County Chapter of the American Red Cross and was appointed Chairman of the Oral Hygiene Committee of the dental work. He recently organized the dental work of the New York Association for Improving the Condition of the Poor.

Dr. Stevenson was one of the consulting dental surgeons in charge of the Oral Hygiene Department of the Presbyterian Hospital. For the past three or four years he had been in great demand as a lecturer on this subject, and appeared before the dental organizations throughout the United States. He was instrumental in the passage of the law legalizing the dental hygienist in the State of New York, and it was through his influence that the State of Pennsylvania and others established laws for the same purpose.

Dr. Stevenson was an active and earnest worker in the Delta Sigma Fraternity and did much to encourage good feelings between members thruout the country.

He is one of the few men who has gained the high esteem and love of all of his fellow practitioners. He was well known thruout the United States for his untiring, self-sacrificing efforts on behalf of his profession and the public. He had achieved the highest goal of mankind—that of having lived so that the world is better off for his having lived in it.

Dr. Stevenson was married to Ellen Sampson Olena in Brooklyn, on June 11th, 1913; is survived by his wife and two children, Albert Henry Jr., six years, and Theothilus Douglas, 3½ years.

His father, Henry Burns Stevenson, was born in England. He was a diamond broker and died at the age of 28, when Dr. Stevenson was only four years old.